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Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

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Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

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Appendix A:

Tree Impacts Summary

Tree Impacts Summary for Design Level Geotechnical Exploration Locations

Boring Number	Location[1]	Tree Trimming or Removal Required	Removal[6]	Trimming[6]	Description of Trees and Shrubs to be Trimmed or Removed [2,4,5]
BA-19	US Borrow	N			
BA-20	US Borrow	N			
BA-21	US Borrow	N			boring location is outside of dripline
BA-22	DS Borrow	N			
UB-28	US Dam Site	N			
UB-44	US Dam Site	N			
UB-45	US Dam Site	N			
UB-46	US Dam Site	N			
UB-48	US Dam Site	N			
UB-49	US Dam Site	N			
UB-51	US Dam Site	N			
UB-52	US Dam Site	N			
UB-53	US Dam Site	N			
UB-54	US Dam Site	N			
UB-55	US Dam Site	N			
UB-56	US Dam Site	N			
UB-57	US Dam Site	N			
UB-58	US Dam Site	N			
UB-59	US Dam Site	N			
UB-60	US Dam Site	N			boring location is outside of dripline
UB-62	US Dam Site	Y	4	0	remove three 6" DBH and one 8" DBH buckeye trees
UB-63	US Dam Site	N			
UB-64	US Dam Site	N			
UB-65	US Dam Site	Y	1	1	remove one 8" DBH buckeye tree; trim one 10" diameter dead live oak limb
UB-66	US Dam Site	N			
UB-67	US Dam Site	N			
UB-70	US Dam Site	N			
UB-71	US Dam Site	N			
UB-72	US Dam Site	N			
UB-73	US Dam Site	N			
UB-74	US Dam Site	N			
UB-75	US Dam Site	N			
UB-76	US Dam Site	N			boring location on road
UB-77	US Dam Site	N			
UB-78	US Dam Site	N			
UB-79	US Dam Site	N			
UB-80	US Dam Site	N			
UB-81	US Dam Site	Y			remove dead snag (Blue oak woodland tree)
UB-82	US Dam Site	Y	1	1	remove one 10" DBH pine tree; trim one 6" diameter oak limb; clear poison oak
UB-83	US Dam Site	N			
UB-84	US Dam Site	N			some sage trimming/removal, no tree impacts

Boring Number	Location[1]	Tree Trimming or Removal Required	Removal[6]	Trimming[6]	Description of Trees and Shrubs to be Trimmed or Removed [2,4,5]
UB-85	US Dam Site	Y	2	3	limbs
UB-86	US Dam Site	N			
UB-87	US Dam Site	N			
UB-88	US Dam Site	Y	2	3	remove one 6" DBH and one 8" DBH buckeye trees; trim two 6" and one 8" diameter buckeye limbs
UB-89	US Dam Site	N			
UB-90	US Dam Site	Y	1	0	remove one 10" DBH blue oak tree
UB-91	US Dam Site	N			
UB-92	US Dam Site	N			
UB-93	US Dam Site	N			
UB-94	US Dam Site	N			
UB-95	US Dam Site	N			
UB-96	US Dam Site	N			
UB-97	US Dam Site	N			boring location on road, no trimming needed
UB-98	US Dam Site	N			
UB-99	US Dam Site	N			some sage trimming/removal, no tree impacts
UB-100	US Dam Site	N			
UB-101	US Dam Site	N			
UB-102	US Dam Site	N			
UB-103	US Dam Site	N			
UB-104	US Dam Site	N			
UB-105	US Dam Site	N			boring location is outside of dripline
UB-106	US Dam Site	N			
UB-107	US Dam Site	N			
UB-108	US Dam Site	N			
UB-109	US Dam Site	N			
UB-110	US Dam Site	N			
UB-111	US Dam Site	N			
L-01	US Reservoir Rim	N			
L-02	US Reservoir Rim	N			
L-03	US Reservoir Rim	N			
L-04	US Reservoir Rim	N			
L-05	US Reservoir Rim	N			
L-06	US Reservoir Rim	N			
L-07	US Reservoir Rim	N			brush clearing needed
L-08	US Reservoir Rim	N			
L-09	US Reservoir Rim	N			
CB-18	Tunnel, Midpoint	N			
CB-19	Tunnel, North End	N			
CB-20	Trenchless Shaft	N			
CB-21	Pipeline	N			
CB-25	Pump Station	N			
S-01	US Borrow	N			
S-02	US Borrow	N			

Boring Number	Location[1]	Tree Trimming or Removal Required	Removal[6]	Trimming[6]	Description of Trees and Shrubs to be Trimmed or Removed [2,4,5]
S-03	US Borrow	N			
S-04	US Borrow	N			
S-05	US Dam Site	N			
S-06	US Dam Site	N			
S-07	US Dam Site	N			
S-08	US Dam Site	N			
S-09	US Dam Site	N			
S-10	US Dam Site	N			
S-11	US Dam Site	N			
S-12	US Dam Site	Y	1	0	trim dead 6" diameter pine limb; cut and move fallen snag
S-13	US Dam Site	N			
S-14	US Dam Site	Y	4	0	remove one 7" DBH and one 14" DBH live oak trees; remove one 10" DBH and one 12" DBH buckeye trees
S-15	US Dam Site	Y	3	2	remove one 7" DBH blue oak tree; remove two 6" DBH buckeye trees; trim two - 8" and 11" diameter blue oak limbs
S-16	US Dam Site	Y	3	0	remove one 5" DBH bay laurel tree; remove one 11" DBH buckeye tree; remove one 10" diameter snag; clear poison oak
S-17	US Dam Site	N			
S-18	US Dam Site	Y	3	4	remove one 12" DBH bay laurel tree; remove one 5" DBH and one 13" DBH buckeye trees; trim two 5" and 10" diameter bay laurel limbs and one dead 3" buckeye limb
S-19	US Dam Site	N			
S-20	US Dam Site	N			
S-21	US Dam Site	N			
S-22	US Dam Site	N			
S-23	US Dam Site	N			
S-24	Borrow	N			
S-25	Borrow	N			
S-26	Pipeline	N			
S-27	Pipeline	N			
S-28	Pipeline	N			
S-29	Pipeline	N			
S-30	Pump Station	N			

Notes:

1) DS = downstream, US = upstream

2) Tree dimensions are DBH. Limb dimensions are where limb attaches to tree.

3) The remaining explorations and their respective locations not shown in this table are outside of tree communities and would not require tree trimming and removal.

4) Removal of trees consists of cutting no less than approximately 3 inches above the ground surface

5) Up to 3 additional trees may be identified for trimming and up to 5 additional trees may be identified for removal in response to unforeseen circumstances requiring their trimming or removal for access. These 8 trees will be located within established work activity areas as per Section 2. None of the 8 trees to be trimmed or removed would be associated with a sensative natural community.

6) The above tree impact summary proposes the removal of up to 30 trees and the trimming of up to 17 trees that are identifed per boring number. However, the trees to be removed or trimmed may vary per what is shown per bore number but the total trees to be trimmed or removed would not be exceeded. None of the trees visible from and along SR-152 would be removed or trimmed.

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

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Appendix B:

Santa Clara Valley Habitat **Plan** -Applicable **Conditions**

Appendix B – Santa Clara Valley Habitat Plan- Applicable Conditions

1 Condition 1. Avoid Direct Impacts on Legally Protected Plant and Wildlife Species

This condition applies to all projects covered under the Valley Habitat Plan and helps to protect species for which environmental permits cannot be granted: Contra Costa goldfields, bald eagle, American peregrine falcon, southern bald eagle, white-tailed kite, California condor, and Ring-tailed cat (= ringtail); also requires compliance with the Migratory Bird Treaty Act and Bald and Golden Eagle Protection Act. For detailed information, see Valley Habitat Plan pages 6-7 to 6-8.

1.1 Applicable text from Condition 1:

Several wildlife species that occur in the study area are listed as fully protected, as defined under Sections 3511 and 4700 of the California Fish and Game Code. As described in Chapter 1, CDFG cannot issue permits for take for 7 of these species.

Fully protected species that are known or likely to occur in the study area are listed below.

- Golden eagle.
- Bald eagle.
- American peregrine falcon.
- Southern bald eagle.
- White-tailed kite.
- California condor.
- Ring-tailed cat (= ringtail).

Three of the fully protected raptor species—white-tailed kite, peregrine falcon, and golden eagle—forage widely throughout the study area but nest in discrete locations. Bald eagles are rare winter migrants to Santa Clara County but have been known to breed in the San Francisco Bay Area. A California condor population has been established in San Benito County (Pinnacles National Monument) and birds forage occasionally in Santa Clara County. Additionally, ringtails may be found in some riparian woodlands in the study area.

Further, all migratory bird species and their nests are protected under the Migratory Bird Treaty Act (MBTA). All birds listed above and those covered by the Plan (western burrowing owl, least Bell's vireo, and tricolored blackbird) are considered migratory birds and subject to the prohibitions of the MBTA. Actions conducted under the Plan must comply with the provisions of the MBTA and avoid killing or possessing covered migratory birds, their young, nests, feathers, or

eggs. As described in Chapter 1, the ESA incidental take permit, once issued by USFWS, will automatically function as an MBTA Special Purpose Permit, as specified under 50 CFR Sec. 21.27, for least Bell's vireo (the only migratory bird listed as threatened or endangered under the ESA) for a 3-year term subject to renewal by the Permittees (see Appendix 5 in U.S. Fish and Wildlife Service and National Marine Fisheries Service 1996). Should any other of the covered migratory birds become listed under the ESA during the permit term, the ESA permit would also constitute a Special Purpose Permit under the MBTA for that species for a 3-year term subject to renewal by the Permittees.

Golden eagle and bald eagle are also protected under the Bald and Golden Eagle Protection Act. Take of golden eagle or bald eagle includes "impacts that result from human-caused alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagle's return, such alterations agitate or bother an eagle to a degree that injures an eagle or substantially interferes with normal breeding, feeding, or sheltering habits and causes, or is likely to cause, a loss of productivity or nest abandonment" (72 FR 31133).

2 Condition 3. Maintain Hydrologic Conditions and Protect Water Quality

This condition applies to all projects covered by the Valley Habitat Plan and helps protect watershed health, primarily through reducing stormwater discharge and pollutant runoff from project sites. Work with the Valley Habitat Plan lead to determine if NPDES compliance is sufficient for the project or if additional measures are required. For detailed information, see Valley Habitat Plan pages 6-12 to 6-13 and Table 6-2.

2.1 Applicable text from Condition 3:

This condition applies to all projects. The implementation of these projects could result in impacts on watershed health through changes in hydrology and water quality. Currently, all Permittees have stormwater management plans that regulate new development and redevelopment as part of compliance with regulations under National Pollutant Discharge Elimination System (NPDES) permit requirements. An amendment to the Clean Water Act, the NPDES Program is a compliance permit regulating any point source pollution that is discharged into waters of the United States. The San Francisco Bay Regional Board administers the NPDES program in for the Coyote and Guadalupe watersheds. The Central Coast Regional Board administers the NPDES program for the Pajaro Watershed which includes Uvas, Llagas, and Pacheco subbasins. The purpose of this condition is to identify a consistent approach for applying the most important water quality conditions of each Regional Board across the study area (North and South County).

Site Design and Avoidance and Minimization Measures

Through development of stormwater management plans and complementary guidance manuals (Santa Clara Valley Urban Runoff Pollution Prevention Program 2006; City of Gilroy 2004; City of Morgan Hill 2004, 2008; Santa Clara Valley Water Resources Protection Collaborative 2006; Santa Clara Valley Water District 2008), the Permittees have identified a set of programmatic avoidance and minimization measures, performance standards, and control measures to minimize increases of peak discharge of stormwater and to reduce runoff of pollutants to protect water quality including during project construction. These avoidance and minimization measures originated, in part, from the measures that are typically required by the Regional Boards and CDFG for projects that have the potential to affect aquatic resources. Many of these avoidance and minimization measures also support the biological goals and objectives of this Valley Habitat Plan. Implementation of these avoidance and minimization measures will reduce the potential for adverse impacts on covered species. Table 6-2 lists avoidance and minimization measures for all water related covered activities described in Condition 3, 4, and 5 of this Plan. Each local jurisdiction, or the Implementing Entity in the case of projects conducted by the Permittees, will verify that all appropriate measures in Table 6-2 are implemented to minimize effects to covered species and their aquatic habitat (see Section 6.8.6). Table 6-2 lists the source control measures and avoidance and minimization measures from the Permittees' existing stormwater management plans and complementary manuals that are most effective in protecting covered aquatic species and aquatic species habitat.

The requirements listed in Table 6-2 include general, project design, construction, and post-construction avoidance and minimization measures. Project design measures are site design

planning approaches that protect water quality by preventing and reducing the adverse impacts of stormwater pollutants and increases in peak runoff rate and volume. They include hydrologic source control measures that focus on the protection of natural resources and the reduction of impervious surfaces. Construction site conditions include source and treatment control measure to prevent pollutants from leaving the construction site and minimizing site erosion and local stream sedimentation during construction. Post-construction conditions include measures for municipal operations, stormwater treatment, and flow control. In addition to the avoidance and minimization measures identified above, several other avoidance and minimization measures are identified in other conditions that will help reduce potential impacts to water quality in the study area. Project proponents will comply with the following conditions as appropriate. ν Condition 2. Incorporate Urban Reserve System Interface Design Requirements. ν Condition 4. Stream Avoidance and Minimization for In-Stream Projects. ν Condition 5. Avoidance and Minimization Measures for In-Stream Operations and Maintenance. ν Condition 7. Rural Development Design and Construction Requirements. ν Condition 8. Implement Avoidance and Minimization Measures for Rural Road Operations and Maintenance. ν Condition 11. Stream and Riparian Setbacks. ν Condition 12. Wetland and Pond Avoidance and Minimization.

3 Condition 4. Avoidance and Minimization for In-Stream Projects

This condition applies to projects that involve instream work (e.g., flood protection, bridge rehabilitation, dam repair) and helps to minimize sediment/pollutant discharge into waterways, disturbance of earth and riparian vegetation, and alteration of the hydrologic and hydraulic characteristics of water bodies. For detailed information, see Valley Habitat Plan pages 6-14 to 6-18.

3.1 Applicable text from Condition 4

The primary purpose of this condition is to identify design requirements and construction practices for in-stream projects to minimize impacts on riparian and aquatic habitat. The term in-stream is defined for the purposes of this Plan as the stream bed and bank and the adjacent riparian corridor. The adjacent riparian corridor encompasses all mapped riparian land cover (i.e., riparian forest and scrub natural community) immediately adjacent to a stream (see Figure 3-10 for mapped land cover types). All in-stream projects must be designed to minimize adverse impacts on stream morphology, aquatic and riparian habitat, and flow conditions. Projects that may also affect wetlands or pond areas are addressed in Condition 12, Wetland and Pond Avoidance and Minimization. All in-stream projects, including projects occurring in dewatered reservoirs, will adopt design requirement and construction avoidance and minimization measures to minimize impacts on covered species, natural communities, and wildlife movement. SCVWD and other Local Partners, such as County Parks, have developed avoidance and minimization measures for projects occurring in streams. The Fishery Network of Central California Coastal Counties (called "FishNet 4C" for the original four counties involved) developed the County Road Maintenance Guidelines for Protecting Aquatic Habitat and Salmon Fisheries (Fishery Network of Central California Coastal Counties 2004). This manual, while focused on road maintenance activities, provides avoidance and minimization measures that are applicable to all types of in-stream construction activities. Table 6-2 summarizes these collected avoidance and minimization measures that are required conditions of in-stream covered activities. Avoidance and minimization measures in this table are applicable to the covered activities addressed in this condition as well as in Condition 3, Maintain Hydrologic Conditions and Protect Water Quality and Condition 5, Avoidance and Minimization Measures for In-Stream Operations and Maintenance. The avoidance and minimization measures address construction staging, dewatering, sediment management, vegetation management, bank protection, drainage, trail construction, and ground disturbance.

All avoidance and minimization measures listed in Table 6-2 are required unless the avoidance and minimization measure is not appropriate for the activity or field data collected at the site or in comparable areas demonstrate that the avoidance and minimization measure would not benefit wildlife or reduce impacts on natural communities. The Implementing Entity will update the avoidance and minimization measures in Table 6-2 over time so that they are more appropriate for implementing a specific covered activity or more beneficial for the covered species. Therefore, the Implementing Entity will update this list of avoidance and minimization measures over the permit term as appropriate to reflect new science and avoidance and minimization measure monitoring results. Proposed revisions will be reviewed by the Wildlife Agencies upon submission of each annual report to ensure the successful implementation of the conservation strategy. Table

6-2 also includes additional avoidance and minimization measures drawn from those currently used by the Local Partners that strive to reflect current and forthcoming regulations and guidelines for in-stream project design (e.g., the State Water Board's Wetland and Riparian Area Protection Policy, described below).

Types of Projects Subject to Condition

The in-stream projects listed below are subject to the design requirements or construction practices because they are expected to result in impacts on creeks or streams.

- Installation or rehabilitation of flood protection projects and levee reconstruction.
- Bank stabilization projects.
- Geomorphic rehabilitation.
- Gravel enhancement.
- Bridge construction and replacement including vehicular, train, and pedestrian bridges throughout the study area.
- Development of trails in or through the in-stream area (stream bed, banks, and adjacent riparian land cover).
- Culvert installation or replacement.
- Dam repair and seismic retrofit, including dewatering events and development of borrow sites.
- Restoration projects throughout the study area, including creek realignment and erosion management.
- Operation, maintenance and replacement of existing water supply structures such as stream gauges, percolation ponds, and diversions.
- Any other activity that requires construction work within the in-stream area (stream bed, banks, and adjacent riparian land cover).

4 Condition 5. Avoidance and Minimization Measures for In Stream Operations and Maintenance

This condition applies to projects that involve operations and maintenance work within and immediately adjacent to the stream channel (e.g., sediment removal, bank stabilization, vegetation management) and helps minimize sediment/pollutant discharge into waterways and disturbance of riparian vegetation. For detailed information, see Valley Habitat Plan pages 6-18 to 6-20.

4.1 Applicable text from Condition 5

In-Stream Operations and Maintenance

In-stream operations[1] and maintenance activities covered under this Plan—such as sediment removal, bank stabilization, vegetation management, and debris blockage removal to maintain flows—have the potential to affect covered species by introducing sediment and other pollutants into downstream waterways or by disturbing riparian land cover associated with streams. Condition 5 specifies avoidance and minimization measures for covered operations and maintenance activities within and immediately adjacent to the stream channel. Note that SCVWD's Stream Maintenance Program is not a covered activity under this Plan and therefore not subject to the conditions of this chapter of the Plan.

The purpose of this condition is to identify avoidance and minimization measures to be applied when conducting in-stream operations and maintenance activities. The measures will help reduce impacts on stream and riparian land cover types and covered species.

Types of Projects Subject to Condition

The following in-stream operations and maintenance activities are subject to the measures or construction practices described below because they are expected to result in impacts on creeks or streams.

- Facility maintenance such as trail, bridge, road, and culvert repair and/or replacement in in-stream areas.
- Natural resource protection such as small bank stabilization projects and removal of debris deposited during flooding.
- Operations and maintenance of flood protection facilities (e.g., dams, armored creeks, detention ponds, streams). Activities may include vegetation management, minor sediment removal, or bank stabilization.
- Operations and maintenance of water supply facilities (e.g., flashboard dams, inflatable dams, stream gages, pipelines, and diversions).

[1] In-stream is defined for the purposes of the Plan as, "the stream bed and bank and the adjacent riparian corridor."

- Non-routine stream maintenance activities conducted by SCVWD (i.e., those activities not covered by SCVWD's Stream Maintenance Program) including extensive removal of vegetation in the Lower Llagas flood control channel.
- Removal of debris blockages except in emergency situations.
- Mitigation and/or monitoring in creeks or adjacent riparian corridors.
- Vegetation management for exotic species removal, such as removal of giant reed, and native vegetation plantings.
- Reservoir dewatering events.
- Reservoir filling.

Avoidance and minimization measures listed in Table 6-2 will apply to all streams in the project areas as well as to open canals, because these canals may provide habitat for covered species.

5 Condition 11. Stream and Riparian Setbacks

This condition applies to projects that overlap a stream or stream setback—requirements differ based on project's location in relation to the urban service area. This condition helps minimize impacts on streams by specifying setbacks and buffer zones.

5.1 Applicable text from Condition 11

includes all development inside the urban service area where a stream or the stream setback overlaps any portion of the parcel on which a covered activity is being implemented. Outside the urban service area, this includes all covered activities where a stream or stream setback overlaps any portion of the development area or project footprint. Exemptions and exceptions may apply as described below in this condition.

Background

The management of stream corridors and associated riparian habitat through the implementation of setbacks has become an increasingly important tool for conserving aquatic and semi-aquatic populations and riparian vegetation and improving water quality. There is strong evidence that riparian buffers of sufficient width protect and improve water quality by intercepting non-point source pollutants in surface and shallow subsurface water flow (e.g., Lowrance et al. 1984; Castelle et al. 1994). Healthy riparian buffers are also widely recognized for their ability to perform a variety of physical and biological functions other than improving water quality. These functions include stabilizing stream channels; controlling erosion by regulating sediment storage, transport, and distribution; providing organic matter (e.g., leaves and large woody debris) that is critical for aquatic organisms; storing nutrients for the surrounding watershed; reducing water temperature through shading; minimizing flood peaks; and serving as key recharge points for renewing groundwater supplies (DeBano and Schmidt 1989; O'Laughlin and Belt 1995). Riparian buffers also provide habitat for a large variety of plant and animal species. Riparian buffers have been proposed, and in some cases proven, to be landscape components that promote wildlife movement, enhance gene flow, increase connectivity of isolated habitat patches, and provide breeding and foraging habitats for animals (Hilty et al. 2006; Rosenberg et al. 1997).

Within the study area, streams provide important breeding, foraging, and movement habitat for California red-legged frog, foothill yellow-legged frog, and western pond turtle. Riparian woodland, which is found next to many of the study area's streams, provides breeding sites for tricolored blackbird and least Bell's vireo. Riparian woodland habitat also protects water quality by filtering inflow, thus reducing pollutant input and sediment load. Finally, stream and riparian areas provide key linkages connecting conservation areas targeted under the Valley Habitat Plan (see Table 5-9 and Figure 5-6).

Because of the importance of streams and associated riparian woodland for the benefit of covered species and as sensitive land cover types addressed by this Plan, this condition was developed to be as protective as feasible within the land use constraints of the local jurisdictions and financial constraints of the Valley Habitat Plan. The following principles were developed to guide the stream and riparian setback condition for this Plan.

- Stream habitat and functions are very difficult to replace once lost; in some cases they cannot be replaced.
- Stream setbacks will be required for all covered activities occurring near streams and riparian areas to minimize effects on covered species as required under the ESA and NCCPA. Additional protections adjacent to streams may also be required for urban redevelopment projects.
- Each of the cities participating in the Valley Habitat Plan, as well as the County, has either setback regulations (Morgan Hill) or policies (San José, Gilroy, County of Santa Clara) currently in place. However, these regulations and policies are not consistent among the jurisdictions. A condition is needed that will make regulatory guidance consistent for all covered activities across all jurisdictions. All covered activities must adhere to both the applicable existing local regulations and the requirements of the Plan.
- The main goal of the stream setback requirement is to minimize further degradation of stream and riparian communities from implementation of covered activities and to maintain basic biological and physical functions of stream and riparian systems.
- The purpose of the stream setback requirement within the urban service area is to, at a minimum, protect stream and riparian communities that provide habitat for covered species because these habitats are unique and cannot be conserved elsewhere within the study area.

Protection of streams and adjacent riparian vegetation under this condition would conserve habitat for California red-legged frog, foothill yellow-legged frog, western pond turtle, and least Bell's vireo. All of these species use stream and riparian habitats as either primary or secondary habitat, as described in Chapter 3, Physical and Biological Resources.

An analysis was performed to determine the overall value of the setback for protecting covered species' habitat. Modeled habitat protected by the setback was quantified and compared to the level of protection provided by the Reserve System alone. In GIS the habitat models for four covered species (California red-legged frog, foothill yellow-legged frog, western pond turtle, and least Bell's vireo) were overlaid with the expected locations and widths of riparian setbacks outside of the planning limit of urban growth (setback avoidance is not required inside the urban service area and so those areas were not included in this analysis) for all covered activities except rural residential development (exact location of rural residential development is not known at this time and thus could not be included in the analysis). Assuming all of these covered activities occur, an additional 2,855 acres (28%) of modeled breeding (primary) habitat for California red-legged frog and an additional 348 miles (50%) of modeled habitat (primary and secondary) for foothill yellow-legged frog would be avoided. Also, implementation of the stream setback would avoid an additional 837 acres (55%) of modeled habitat for least Bell's vireo. Setback benefits to these

species and western pond turtle are summarized in Table 6-5. Stream habitat for covered species will likely overlap (i.e., miles and acres referenced in the table and above are not additive).

Definitions

The following terms are defined for this condition. These definitions are also found in the glossary (Appendix A).

Riparian habitat or riparian vegetation: Riparian vegetation is associated with river, stream, or lake banks and floodplains. Riparian vegetation is also defined by USFWS (2009) as plant communities contiguous to and affected by surface and subsurface hydrologic features of perennial or intermittent lotic and lentic water bodies (i.e., rivers, streams, lakes, or other watercourses). Riparian areas have one or both of the following characteristics: 1) distinctively different vegetation than adjacent areas, 2) species similar to adjacent areas but exhibiting more vigorous or robust growth forms due to the greater availability of surface and subsurface water.

- **Stream:** A watercourse that flows at least periodically or intermittently through a bed or channel having banks. This may include watercourses having a surface or subsurface flow that supports or has supported riparian vegetation, fish or other aquatic life. In the context of the Habitat Plan, a watercourse must meet SCVWD "Criteria to Verify or Identify a Watercourse as a Stream" discussed below under Framework (Santa Clara Valley Water Resources Protection Collaborative 2006) to qualify as a stream.
- **Reach**: A section of a stream. Reaches are defined based on a specific need (e.g., monitoring) and do not necessarily reflect a standard set of characteristics.
- **Perennial stream:** A stream with year-round surface flow that is supplied by both rainfall runoff and groundwater, as well as by substantial dry-season inputs (e.g., runoff). Santa Clara Valley Habitat Plan August 2012 6-46 05489.05 Chapter 6. Conditions on Covered Activities and Application Process
- **Intermittent stream:** A stream that is supplied by both rainfall runoff and groundwater. Intermittent streams tend to be seasonal, with flow during the rainy season and into the late spring or early summer.
- **Ephemeral stream:** A stream that flows only in response to rain events and receives no groundwater input. As defined in the Valley Habitat Plan, ephemeral streams will not include irrigation ditches, underground streams, or drainages and swales that have neither defined bed and bank nor evidence of scour or sediment transport. All other ephemeral drainages that qualify as streams will be considered under the Valley Habitat Plan.

Framework

This condition will apply to all covered activities, including those within the Reserve System. This condition also has exemptions and exceptions as described in subsequent sections below. The width of the setback is driven by the following criteria:

- Stream community,
- slope, and
- location of the covered activity in relation to the urban service area of each local jurisdiction.
- Each of these criteria is described below.

Stream Community

Stream communities are grouped into two simplified categories for the purposes of this condition. These categories are based on broad definitions of the biological characteristics of those communities and correspond to the level of habitat quality for covered species and sensitive riparian communities within the study area. Categories for the stream setback requirement are provided below.

- Category 1. This stream type has sufficient flow to support covered species and riparian habitat. These streams include perennial streams and some intermittent streams. These streams are typically larger than ephemeral drainages and support movement of covered species along the length of the stream. The ability of these streams to also support healthy riparian habitats bolsters the ecological value of the stream. This category also includes all in-channel ponds downstream of reservoirs. These streams are shown in Figure 6-216 .
- Category 2. This stream type may not have sufficient flow to support covered species and riparian habitat. These streams include all ephemeral streams and some intermittent stream reaches. These reaches provide minimum support of water-quality functions and primary breeding habitat for covered species. Category 2 streams are not specifically mapped as part of the Valley Habitat Plan. They include both identified streams (named creeks and USGS blueline creeks) that are not classified as Category 1 streams (as shown in Figure 6-2) and other unmapped streams that meet the "Criteria to Verify or Identify a Watercourse as a Stream" as defined below.

Categories are applied to reaches of streams as opposed to entire streams. This is because almost all streams begin in the uppermost portions of their watersheds as ephemeral streams and gradually become intermittent or perennial and they move downslope and accumulate flows from the watershed and, sometimes, the groundwater basin. As such, a single stream may contain both Category 1 and Category 2 reaches.

The mapped stream network for the Valley Habitat Plan does not differentiate between perennial, intermittent, and ephemeral drainages. However, SCVWD developed a map of all fish-bearing streams in the study area. While fish are not covered by this Plan, presence of fish is a good indicator of the stream type. For example, ephemeral streams do not generally support fish. As such, the stream categories are identified using fish-bearing or non-fish bearing streams as a proxy for Category 1 and Category 2 streams, respectively. Reaches for which fish data are unknown are assumed not to support fish and are included in Category 2. Category 2 reaches cannot occur downstream of a Category 1 reach.

Criteria to Verify or Identify a Watercourse as a Stream

While all Category 1 streams are mapped by the Plan, not all Category 2 streams are mapped. If a watercourse is not mapped by the Plan, but does meet the following criteria, it will be classified as a Category 2 stream. The following is based on the Santa Clara Valley Water Resources Protection Collaborative (2006). A watercourse which does not appear to fit into one of the two described stream categories may be considered a stream if the director of the planning department of the local jurisdiction determines that the watercourse complies with all of the following three criteria:

1. the watercourse is hydrologically connected to a waterway above and below the site or is connected to a spring, headwaters, lake, and/or bay based on satisfying at least one of the conditions identified in paragraph (A) below; and
2. the watercourse is within a defined channel which includes a bed, bank, and exhibits features that indicate actual or potential sediment movement based on satisfying at least one of the conditions identified in paragraph (B) below; and
3. the watercourse occupies a specific topographic position based on satisfying at least one of the conditions identified in paragraph (C) below.

In determining whether the subject watercourse possesses these three features, the following criteria will be examined by the Local Partner with jurisdiction over the covered activity. If necessary, this determination may require the technical expertise and recommendations of a qualified biologist, hydrologist, or other qualified professional. In addition, the Local Partner with jurisdiction over the covered activity may require the project proponent to provide additional information as deemed necessary to determine if the watercourse satisfies the three criteria listed below.

This process will not be used to determine if a CDFG Streambed Alteration Agreement will be required pursuant to Section 1600 et seq. of the California Fish and Game Code or to determine if a Corps Section 404 Clean Water Act permit will be required.

Hydrologic Connectivity—Criterion #1 above will be considered met if any of the following conditions are present:

1. Stream headwaters, springs, in-channel culverts, underground seepage, or groundwater flow are present and capable of providing hydrologic connectivity to recognized watercourses. Sections of stream placed underground by manmade infrastructure (e.g., culverts) are not considered streams for the purpose of this condition except as noted in paragraph B item 4 below.

2. Streams may become connected across or over manmade improvements such as roads (e.g., a temporary connection during a storm event). Except for stream channel improvements, water flowing across or over such improvements within the public right-of-way is not considered a stream. Sections above and/or below this connectivity are streams if they meet the other required features.
3. Springs are present and are considered part of a stream if located above (uphill from) stream initiation.

B. Channel Form—Criterion #2 above will be considered met if any of the following conditions are present:

1. The watercourse has a stream channel, beginning at the point of bed and bank initiation, which may be natural, altered, or engineered.
2. The stream channel must have enough flow under present-day conditions to maintain channel form and to move sediment. A non-engineered stream channel bed and bank are created and maintained by erosion and sedimentation, thus the presence of a channel with bed and bank is itself evidence of sufficient flow. Flow volume or timing is not criteria for stream determination.
3. The stream channel has evidence of scour, sedimentation, sediment sorting, undercut banks and/or other erosion, deposition, or transport features —all of which support sediment movement. Engineered or altered channels exist and are partially or wholly made of earth, concrete, rip rap, or other materials. The hardened nature of these channels bed and banks, and a lack of available sediment along the channel reach, may prevent signs of sediment movement or scour. Such channels need not have explicit evidence of sediment transport.
4. A currently underground stream was filled without appropriate permits from all applicable regulatory agencies (federal, state, and local) or is underground due to a landslide.

C. Topographic Position—Criterion #3 above will be considered met if any of the following conditions are present:

1. The watercourse is either a 'U' or 'V' shaped channel typically located at the low point of a macro-topographic feature.
2. The watercourse consists of bowl, 'U', or 'V' shaped topography with high points draining to valley or ravine as part of a large drainage network leading to large streams, lakes and/or a bay.
3. The watercourse located on flatland consists of shallow bowl or 'U' shaped topography. Generally these streams flow from the hills toward a bay following the slope of the land. Stream topography can be indicated on a topography map by a 'U' or 'V' shape pointed in the uphill direction.

Slope

Slope is an important determinant of soil stability and therefore erosion and sedimentation rates into streams. Steeper slopes erode faster and are more susceptible to disturbance by the covered activities. To account for these factors, stream setback requirements are greater on steeper slopes.

The slope categories developed for the Valley Habitat Plan were based on slope-stability categories in local codes and guidelines. Two slope categories were created. Slope categories are as follows.

- 0%–30% Slopes. Generally stable slopes. This category does not require additional setbacks beyond those identified above.
- >30% Slopes. Increasingly unstable slopes. This category requires increase protection and greater stream setbacks.

If the development area as described in Condition 7 is located within 200 feet of a Category 1 stream, the project proponent will include site topography on the development area map (see Section 6.8.2 Item 2: Project Description and Map) in 5-foot intervals in elevation. The project proponent will also calculate the average slope of the development area to determine how this criterion is applied. Slope is defined as the average natural slope of the land within the proposed development area based on an engineered site plan. The average slope is determined by the formula:

$$S = (I*L/ A)*100, \text{ where}$$

S is the average slope of the area in percent; I is the contour interval in feet; L is the combined length of contour lines in feet; and A is the area of the development area. Average site slope will be calculated by a registered civil engineer or licensed or land surveyor.

Required Setbacks

Stream setback requirements have been developed on the basis of an extensive literature review of applicable research from both local and national sources (Table 6-6) and in consultation with the Wildlife Agencies. Scientific studies to determine minimum setbacks typically recommend relatively modest setbacks (an average of 58 feet) to protect water quality (e.g., sediment and nutrient loading). Recommended setbacks to enhance stream ecology were greater and ranged from 85 to 220 feet with an average of 132 feet. Setbacks intended to provide protection for plants and wildlife were the greatest and ranged from 30 to 1,600 feet, with an average range of 335 to 410 feet (Table 6-6).

Working from scientifically rigorous definitions of appropriate setbacks, further refinement of setbacks was coordinated with the Local Partners to determine setback widths that, while consistent with the literature, limited the number of situations in which the setback would create undue hardship upon property owners or be infeasible to implement on a consistent basis (the setback would create a large number of property exemptions). As such, the setbacks identified for this Plan (35 to 250 feet) balance the need to protect ecological functions with surrounding land uses and private property constraints.

A stream setback, measured from top of the stream bank, will be applied to all covered activities as shown in Table 6-7. To facilitate implementation of this condition, required setbacks are described below based on project location. Figures 6-3a through 6-3d illustrate different applications of the setback.

Outside the Urban Service Area

Outside of the urban service area, setback requirements are greater. For Category 1 streams the setback distance is 150 feet (see Figure 6-3d). The setback is increased by 50 feet for slopes greater than 30% to compensate for increased slope instability and higher anticipated rates of erosion (Figure 6-3a). In addition, if the site supports riparian vegetation, the setback is either the riparian edge plus a 35-foot buffer or the setback described above, whichever is greater.

The setback for all Category 2 streams is 35 feet regardless of location or slope (Figure 6-3c). If the site supports riparian vegetation, the setback will extend from the riparian edge plus a 35-foot buffer. Unless a covered activity meets the "Exemption" criteria or is granted a stream setback exception, as described below, implementation of covered activities is prohibited within the stream setback. Project proponents of projects located outside the urban service area must ensure that the development area does not encroach into the stream setback unless an exemption or an exception is applied. Projects or portions of projects that qualify for an exemption or exception are described below.

Exemptions

The exemptions below apply regardless of location. If a covered activity qualifies for an exemption, a stream setback is not applied and the project proponent is not required to comply with this condition. However, other conditions may still apply and the project is still required to pay all applicable fees (e.g., land cover fee, wetland fee) as described in Chapter 9. Exemptions from the stream setback include the following.

1. Any activity that is not a covered activity and not subject to the Valley Habitat Plan or its conditions.
2. Activities listed as exempt in Section 6.2.
3. Development on parcels less than 0.5 acre.
4. Covered activities that require work within or adjacent to streams such as bridges, levee maintenance and repair, flood-protection projects, stream maintenance, outfall installation and maintenance, flood-protection capital projects, dam-related capital projects.
5. Recreational trails (see Condition 4 and 9 for details on trail siting).
6. Replacement of utilities that result in no new permanent disturbance to the riparian corridor during construction and operation and generate only temporary loss of habitat. (This exemption does not apply for utility projects that result in new permanent riparian impacts.)
7. Stream crossings essential to provide a means of access to parcel or facility.

Exceptions

Stream setback policies that apply to a large number of parcels with varying characteristics require a clear and practical set of exceptions. The term exception means an allowance for reductions in mandated setback distances necessary to allow reasonable use and development of a property based on the variety of constraints and factors that may affect the property. In situations where

exceptions are granted, portions of this stream setback condition may still apply. Exceptions will be used in a minority of cases with special circumstances that limit or restrict the ability of a landowner to fully apply the stream setback. For example, geologic and seismic hazards, unusual lot size or configurations, unusual slope, or grading and access issues may present site constraints that require exceptions to the stream setback condition in order to allow reasonable development of a site consistent with local land use regulations.

For all proposed exceptions to the stream setbacks (inside or outside the urban service area), exceptions will be considered based on the following factors:

1. The existence of legal uses within the setback.
2. The extent to which meeting the required setback would result in a demonstrable hardship (i.e., denies an owner any economically viable use of his land or adversely affects recognized real property interests) for the applicant.
3. The extent to which meeting the required setback would require deviation from, exceptions to, or variances from other established policies, ordinances or standards regarding grading, access, water supply, wastewater treatment, disposal systems, geologic hazards, zoning, or other established code standards.
4. The stream setback exception does not preclude achieving the biological goals and objectives of the Valley Habitat Plan or conflict with other applicable requirements of the Valley Habitat Plan and local policies.

Regardless of project location, stream setback exceptions may not reduce a Category 1 stream setback to less than a distance of 50 feet for new development or 35 feet for existing or previously developed sites with legal buildings and uses (Figure 6-3b). All applicable fees must be paid for areas granted an exception.

Exceptions may be requested through the standard application process described in Section 6.8, or through a separate request process. Applicants must apply for a stream-setback exception through their local jurisdiction. All private applications for stream-setback exceptions must be reviewed and approved by the local jurisdiction. For projects implemented by a local jurisdiction, exception requests must be made to the Implementing Entity. The findings required to approve the stream setback exception must be supported by factual information and judgments in the record.

As part of the review process, the local jurisdiction or the Implementing Entity must consider the implications of a reduced setback on the riparian system and covered species, progress toward the biological goals and objective of the Plan, and potential effects on adjacent properties. The local jurisdiction or the Implementing Entity must make written findings that document these considerations and the rationale for the stream-setback exception (see below for specific required findings). The local jurisdiction or the Implementing Entity may require technical reports from qualified professionals or consultants to support the application or request. For example, for any significant proposed reduction, a report by a qualified biologist, stream hydrologist, registered engineer, or other professional may be required as a basis for making necessary findings. Please see Section 6.8.5 for definition of a “qualified biologist.”

If the stream setback exception is granted at an administrative level (Zoning Administrator) or by a designated decision-making authority (Planning Commission), local agencies must include provisions that allow appeal of this decision to the elected legislative body of the applicable agency. Applicable fees may be imposed by the legislative body for processing such appeals, as well as for the original exception requests.

Prior to granting the exception, the local jurisdiction will provide the exception request and proposed decision to both the Implementing Entity and the Wildlife Agencies for review and comment. The Implementing Entity and Wildlife Agencies will have 30 days to review the request and provide a written response. A local agency cannot take an action until after that 30 day-period. The Implementing Entity will compile a list of all exceptions granted each calendar year for inclusion in the annual report to the Wildlife Agencies.

6 Condition 12. Wetland and Pond Avoidance and Minimization

This condition applies to projects that are covered under the Valley Habitat Plan and helps to minimize impacts on wetlands and ponds and avoid impacts on high quality wetlands and ponds by prescribing vegetated stormwater filtration features, proper disposal of cleaning materials, and other requirements.

6.1 Applicable text from Condition 12

The purpose of this condition is to minimize direct and indirect impacts to wetlands and ponds and in some cases, avoid direct and indirect impacts to high quality wetlands and ponds. Direct impacts are those that directly affect a wetland or a pond within its mapped boundary (see Section 6.8.4 Item 4: Map of Wetlands and Waters for a description of mapping direct impacts to wetlands). Project proponents are required to pay a wetland fee for impacts to wetlands and ponds to cover the cost of restoration or creation of aquatic land cover types required by this Plan (see Chapter 9 for details on this wetland fee). Covered activities can avoid paying the wetland fee if they avoid impacts to the wetland.

All project proponents will implement the following actions to avoid and minimize impacts of covered activities on wetlands and ponds.

Planning Actions

- Projects must be designed to avoid and minimize impacts to wetlands to the maximum extent practicable.
- Applicants with streams on site must follow the stream setback requirements in Condition 11.
- Applicants for coverage under the Plan must follow the requirements and guidelines in Condition 3 to minimize the effects of development on downstream hydrology, streams, and wetlands.

Design

- Locate septic facilities, if used, at least 100 feet from the edge of a wetland or pond if space allows.
- If the runoff from the development will flow within 100 feet of a wetland or pond, install vegetated stormwater filtration features, such as rain gardens, grass swales, tree box filters, or infiltration basins, to capture and treat flows.
- Plant native vegetation (shrubs and small trees) between the wetland or pond and the development such that the line of sight between the wetland or pond and the development is shielded.
- If during the environmental review process it is shown that a project has adverse indirect impacts to the wetland's function (change in hydrological functions, etc.), the project will be required to avoid these indirect effects, as determined on a case-by-case approach by

the local jurisdiction, in consultation with the Implementing Entity. If a Local Partner is carrying out the activity, it will coordinate avoidance measures with the Implementing Entity. Wetlands that are not completely avoided, including indirect effects, will be considered permanently impacted and will count towards the impact caps described in Table 4-2 and will be assessed fees as described in Chapter 9. If however, the local jurisdiction demonstrates to the Wildlife Agencies that the wetlands to be indirectly affected are highly degraded prior to project impacts, and the Wildlife Agencies agree, impacts will not be counted toward the impact caps described in Table 4-2 and fees will not be assessed. "Highly degraded" wetlands could include, but are not limited to, those that are indirectly affected by surrounding development or agriculture to the extent that hydrology, water quality, or habitat for covered species is adversely affected.

Construction Actions

- Personnel conducting ground-disturbing activities in or adjacent to wetlands and ponds will be trained by a qualified biologist in these avoidance and minimization measures and the permit obligations of project proponents working under this Plan.
- All wetlands and ponds to be avoided by covered activities will be temporarily staked in the field by a qualified biologist to ensure that construction equipment and personnel avoid these features.
- Fencing will be erected along the outer edge of the project area, between the project area and a wetland or pond. The type of fencing will match the activity and impact types. For example, projects that have the potential to cause erosion will require erosion control barriers (see below), and projects that may bring more household pets to a site will be fenced to exclude pets. The temporal requirements for fencing also depend on the activity and impact type. For example, fencing for permanent impacts will be permanent, and fencing for short-term impacts will be removed after the activity is completed.
- Appropriate erosion control measures (e.g., fiber rolls, filter fences, vegetative buffer strips) will be used on site to reduce siltation and runoff of contaminants into wetlands, ponds, streams, or riparian woodland/scrub. Filter fences and mesh will be of material that will not entrap reptiles and amphibians. Erosion control blankets will be used as a last resort because of their tendency to biodegrade slowly and trap reptiles and amphibians.
- Erosion-control measures will be placed between the wetland or pond and the outer edge of the project site.
- Fiber rolls used for erosion control will be certified as free of noxious weed seed. ν Seed mixtures applied for erosion control will not contain invasive nonnative species, but will rather be composed of native species appropriate for the site or sterile nonnative species. If sterile nonnative species are used for temporary erosion control, native seed mixtures must be used in subsequent treatments to provide long-term erosion control and slow colonization by invasive nonnatives.

- Vehicles and equipment will be parked on pavement, existing roads, and previously disturbed areas.
- Trash generated by covered activities will be promptly and properly removed from the site. ν No construction or maintenance vehicles will be refueled within 200 feet of avoided wetlands and ponds unless a bermed and lined refueling area is constructed and hazardous material absorbent pads are available in the event of a spill.
- All management of pest species will be conducted in compliance with the County integrated pest management (IPM) ordinance. In addition, other requirements identified in this chapter that exceed the requirements of the IPM ordinance will be implemented.
- Where appropriate to control serious invasive plants, herbicides that have been approved by EPA for use in or adjacent to aquatic habitats may be used as long as label instructions are followed and applications avoid or minimize impacts on covered species and their habitats. In wetland environments, appropriate herbicides may be applied during the dry season to control nonnative invasive species (e.g., yellow star-thistle). Herbicide drift will be minimized by applying the herbicide as close to the target area as possible. Herbicides will only be applied by certified personnel in accordance with label instructions.
- All organic matter should be removed from nets, traps, boots, vehicle tires and all other surfaces that have come into contact with ponds, wetlands, or potentially contaminated sediments. Items should be rinsed with clean water before leaving each study site (U.S. Fish and Wildlife Service 2005).
- Implement measures to minimize the spread of disease and non-native species based on current Wildlife Agency protocols (e.g., Revised Guidance on Site Assessments and Field Surveys for the California Red-legged Frog: Appendix B, Recommended Equipment Decontamination Procedures [U.S. Fish and Wildlife Service 2005]) and other best available science.
- Used cleaning materials (liquids, etc.) should be disposed of safely, and if necessary, taken off site for proper disposal. Used disposable gloves should be retained for safe disposal in sealed bags (U.S. Fish and Wildlife Service 2005).
- Portions of the project that occur in streams will comply with Condition 4.

7 Condition 14. Valley Oak and Blue Oak Woodland Avoidance and Minimization

This condition applies to projects that are covered under the Valley Habitat Plan and helps to minimize and avoid valley and blue oak woodland by specifying buffer zones, pruning regulations, and other requirements. For detailed information, see Valley Habitat Plan pages 6-60 to 6-61.

7.1 Applicable text from Condition 14

Valley oak woodland and blue oak woodland are considered by CDFG to be sensitive biotic communities (California Department of Fish and Game 2003). There is evidence that valley oak woodland was once one of the dominant land cover types on the floor of the Santa Clara Valley, but it has been largely removed by urban and agricultural development (San Francisco Estuary Institute 2006, 2008). These communities can provide important foraging or movement habitat for species covered by the Plan—California red-legged frog, and California tiger salamander—as well as for many other native species. For these reasons, these two oak woodland land cover types would benefit from some avoidance and minimization associated with covered activities. All covered activities will implement the following actions to avoid or minimize impacts on valley and blue oak woodland.

Project Planning

- Projects on sites supporting substantial stands of valley oak woodland or blue oak woodland will minimize their impacts on these communities and preserve these stands on site when to do so would further the biological goals and objectives of the Plan. For example, projects should preserve oak woodland communities that are adjacent to existing stands of protected oak woodlands to avoid habitat fragmentation and degradation of wildlife linkages. ν Projects will avoid to the maximum extent feasible irrigating in and around valley oak woodland and will avoid altering hydrology of the site, including location of septic leach fields, such that valley oak woodland receives more water than under pre-project conditions.
- Large and healthy trees will be maintained on site whenever feasible. Local jurisdictions may set tree size thresholds for preservation that are consistent with local tree ordinances. Large valley oak trees still healthy today are clearly visible on air photos from as far back as 1939 (San Francisco Estuary Institute 2006), even though they are surrounded by agricultural fields or urban development. Preserved trees can provide habitat value for many decades; they also provide a significant community amenity.

- If trees are maintained on a site, buffer zones will be established between preserved valley oak or blue oak trees and development at a distance equal to or greater than the root protection zone, which is defined as a buffer zone determined by calculating one foot for each inch of trunk diameter measured at 4.5 feet above ground surface (Matheny and Clark 1998).

Project Construction

- Temporary project access points will be constructed as close as possible to the work area to minimize necessity for tree removal. ν Roads and pathways will be aligned outside of the tree's root protection zone (as defined above) whenever possible.
- Roads and pathways designed beneath or within 25 feet of the dripline of oak trees will be graded using hand-held equipment and will use permeable surfacing (e.g., grass pavers that allow runoff to infiltrate the ground).
- Alteration of natural grade through fill or other means within the root protection zone of oak trees will be minimized. ν Trenching for utility lines and other purposes will be minimized within root protection zones. Utilities may be installed in these areas by boring below the root zone.
- If extensive pruning of blue oaks and valley oaks is necessary, pruning will be conducted during the winter dormant period for these species and under the supervision of an arborist certified to International Society of Arboriculture or similar standards.

8 Condition 15. Western Burrowing Owl

This condition applies to projects that are located within any grassland, oak woodland, or agricultural land cover type and within Wildlife Survey Area, or where burrowing owl nesting or breeding habitat has been documented by survey. This condition helps protect western burrowing owls by prescribing preconstruction surveys, construction buffer zones, biological monitoring, and other requirements. For detailed information, see Valley Habitat Plan pages 6-62 to 6-67.

8.1 Applicable text from Condition 15

To avoid or minimize direct impacts of covered activities on western burrowing owls, the procedures described below will be implemented. This condition incorporates survey, avoidance, and minimization guidelines from the following western burrowing owl conservation plans and other sources pertaining to the study area. The avoidance and minimization process for western burrowing owl as required in this condition is illustrated in Figure 6-4.

- CDFG Staff Report on Burrowing Owl Mitigation (California Department of Fish and Game 1995).
- CDFG Staff Report on Burrowing Owl Mitigation (California Department of Fish and Game 2012).
- Draft Burrowing Owl Habitat Conservation Strategy and Implementation Plan (City of San José 2000).
- City of Morgan Hill—Citywide Burrowing Owl Habitat Mitigation Plan (City of Morgan Hill 2003).
- Personal communication with Jack Barclay regarding ongoing monitoring efforts in the study area including annual monitoring at San José International Airport.
- Various unpublished reports from survey efforts in the study area.
- Guidance from CDFG.

Western Burrowing Owl Habitat Survey

Western burrowing owl habitat surveys will be required in the study area in all modeled occupied nesting habitat (see Figure 5-11). Surveys are not required in sites that are mapped as potential burrowing owl nesting or only overwintering habitat. Modeled habitat types may change throughout the permit term based on the best available scientific data. For example, the Implementing Entity will be conducting annual surveys or collecting annual survey data of other organizations in occupied nesting habitat throughout the permit area to determine the annual status of known nesting areas the number of adult breeding owls present. The Implementing Entity will also coordinate with other South Bay local governments, special districts, and non-profit organizations every 3 years to assess status of the burrowing owl population in the entire study area and the expanded study area for burrowing owl conservation, outside areas of modeled occupied habitat.

Habitat surveys in occupied nesting habitat are required in both breeding and non-breeding seasons. If the project site falls within occupied nesting habitat, a qualified biologist will map areas with burrows (i.e., areas of highest likelihood of burrowing owl activity) and all burrows that may be occupied (as indicated by tracks, feathers, egg shell fragments, pellets, prey remains, or excrement) on the project site. This mapping will be conducted while walking transects throughout the entire project footprint, plus all accessible areas within a 250-foot radius from the project footprint. The centerline of these transects will be no more than 50 feet apart and will vary in width to account for changes in terrain and vegetation that can preclude complete visual coverage of the area. For example, in hilly terrain with patches of tall grass, transects will be closer together, while in open areas with little vegetation they can be 50 feet apart.

This methodology is consistent with other accepted survey protocols for this species (California Burrowing Owl Consortium 1993). The Implementing Entity may update this protocol during the permit term based on changes to the accepted protocol with the concurrence of the Wildlife Agencies. Adjacent parcels under different land ownership will be surveyed only if access is granted or if the parcels are visible from authorized areas.

If suitable habitat is identified during the habitat survey, and if the project does not fully avoid impacts to the suitable habitat, preconstruction surveys will be required. Suitable habitat is fully avoided if the project footprint does not impinge on a 250-foot buffer around the suitable burrow.

Preconstruction Survey

Prior to any ground disturbance related to covered activities, a qualified biologist will conduct preconstruction surveys in all suitable habitat areas as identified during habitat surveys. The purpose of the preconstruction surveys is to document the presence or absence of burrowing owls on the project site, particularly in areas within 250 feet of construction activity.

To maximize the likelihood of detecting owls, the preconstruction survey will last a minimum of three hours. The survey will begin 1 hour before sunrise and continue until 2 hours after sunrise (3 hours total) or begin 2 hours before sunset and continue until 1 hour after sunset. Additional time may be required for large project sites. A minimum of two surveys will be conducted (if owls are detected on the first survey, a second survey is not needed). All owls observed will be counted and their location will be mapped.

Surveys will conclude no more than 2 calendar days prior to construction. Therefore, the project proponent must begin surveys no more than 4 days prior to construction (2 days of surveying plus up to 2 days between surveys and construction). To avoid last minute changes in schedule or contracting that may occur if burrowing owls are found, the project proponent may also conduct a preliminary survey up to 14 days before construction. This preliminary survey may count as the first of the two required surveys as long as the second survey concludes no more than 2 calendar days in advance of construction.

Implementation of Covered Activities in Burrowing Owl Habitat

In order to allow covered activities to go forward in burrowing owl habitat prior to the formal take authorization of individuals described above, project applicants will employ avoidance measures described below to ensure that direct take does not occur. Application of these measures is

illustrated in Figure 6-4. The below avoidance measures apply to all projects that affect any burrowing owl habitat, regardless of whether surveys are required by this condition. In other words, if a project is occurring outside of modeled occupied nesting habitat, the project proponent is obligated to ensure avoidance and minimization of impact to burrowing owls according to the measures described below.

Avoidance Measures

Breeding Season

If evidence of western burrowing owls is found during the breeding season (February 1–August 31), the project proponent will avoid all nest sites that could be disturbed by project construction during the remainder of the breeding season or while the nest is occupied by adults or young (occupation includes individuals or family groups foraging on or near the site following fledging). Avoidance will include establishment of a 250-foot non-disturbance buffer zone around nests. Construction may occur outside of the 250-foot non-disturbance buffer zone. Construction may occur inside of the 250-foot non-disturbance buffer during the breeding season if:

- the nest is not disturbed, and
- the project proponent develops an avoidance, minimization, and monitoring plan that will be reviewed by the Implementing Entity and the Wildlife Agencies prior to project construction based on the following criteria.
    - The Implementing Entity and the Wildlife Agencies approves of the avoidance and minimization plan provided by the project applicant.
    - A qualified biologist monitors the owls for at least 3 days prior to construction to determine baseline nesting and foraging behavior (i.e., behavior without construction).
    - The same qualified biologist monitors the owls during construction and finds no change in owl nesting and foraging behavior in response to construction activities.
    - If there is any change in owl nesting and foraging behavior as a result of construction activities, these activities will cease within the 250-foot buffer. Construction cannot resume within the 250-foot buffer until the adults and juveniles from the occupied burrows have moved out of the project site.
    - If monitoring indicates that the nest is abandoned prior to the end of nesting season and the burrow is no longer in use by owls, the non disturbance buffer zone may be removed. The biologist will excavate the burrow to prevent reoccupation after receiving approval from the Wildlife Agencies.

The Implementing Entity and the Wildlife Agencies have 21 calendar days to respond to a request from the project proponent to review the proposed construction monitoring plan. If these parties do not respond within 21 calendar days, it will be presumed that they concur with the proposal and work can commence.

Non-Breeding Season

During the non-breeding season (September 1–January 31), the project proponent will establish a 250-foot non-disturbance buffer around occupied burrows as determined by a qualified biologist. Construction activities outside of this 250-foot buffer are allowed. Construction activities within the non-disturbance buffer are allowed if the following criteria are met in order to prevent owls from abandoning important overwintering sites.

- A qualified biologist monitors the owls for at least 3 days prior to construction to determine baseline foraging behavior (i.e., behavior without construction).
- The same qualified biologist monitors the owls during construction and finds no change in owl foraging behavior in response to construction activities.
- If there is any change in owl nesting and foraging behavior as a result of construction activities, these activities will cease within the 250-foot buffer.
- If the owls are gone for at least one week, the project proponent may request approval from the Implementing Entity that a qualified biologist excavate usable burrows to prevent owls from re-occupying the site. After all usable burrows are excavated, the buffer zone will be removed and construction may continue.

Monitoring must continue as described above for the non-breeding season as long as the burrow remains active.

Construction Monitoring

Based on the avoidance, minimization, and monitoring plan developed (as required in the above section), during construction, the non-disturbance buffer zones will be established and maintained if applicable. A qualified biologist will monitor the site consistent with the requirements described above to ensure that buffers are enforced and owls are not disturbed. The biological monitor will also conduct training of construction personnel on the avoidance procedures, buffer zones, and protocols in the event that a burrowing owl flies into an active construction zone.

Passive Relocation

Passive relocation would not be allowed under the Plan until the positive growth trend described in Section 5.4.6 is achieved. Once this occurs, passive owl relocation may be allowed, with the approval of the Wildlife Agencies, on project sites in the non-breeding season (September 1–January 31) if the other measures described in this condition do not allow work to continue. Passive relocation would only be proposed if the burrow needed to be removed, or had the potential of collapsing (e.g., from construction activities), as a result of the covered activity.

If passive relocation is eventually allowed, a qualified biologist can passively exclude birds from their burrows during non-breeding season only by installing one-way doors in burrow entrances. These doors will be in place for 48 hours to ensure owls have left the burrow, and then the biologist will excavate the burrow to prevent reoccupation. Burrows will be excavated using hand tools. During excavation an escape route will be maintained at all times. This may include inserting an artificial structure into the burrow to avoid having the overburden collapse into the burrow

and trapping owls inside. Other methods of passive relocation, based on best available science, may be approved by the Wildlife Agencies during Plan implementation.

Exceptions to Passive Relocation Prohibition

Due to the relatively low numbers of burrowing owls in the study area, it is not expected that the prohibition of passive relocation will result in project delays. However, it is possible that a covered activity could not proceed due to avoidance measures for burrowing owl in this condition if owls continually persist on a site where avoidance is not feasible. In such cases, a project proponent may apply for an exception based on the following process. For this condition, the term exception means an allowance to conduct passive relocation of burrowing owls during the non-breeding season only when this activity is not otherwise allowed. This exception process is necessary to allow reasonable use and development of a property based on the variety of constraints and factors that may affect the property. In situations where exceptions are granted, other portions of this condition may still apply. Exceptions will be used in a minority of cases with special circumstances that limit or restrict the ability of a landowner to fully apply the condition.

Exceptions may be requested through the standard application process described in Section 6.8, or through a separate request process. Private applicants must apply for a passive relocation exception through their local jurisdiction. Project proponents must develop and submit with the request for exception a passive relocation plan. The passive relocation plan must document the following.

1. That owls have occupied the site for a full year without relocating voluntarily. Surveys documenting presence must be completed by a qualified biologist and results must be provided in a written report. The report should confirm that one or more individuals (i.e., unique owl[s]) were monitored for a year and that the owl(s) had used the site for a full year20 .
2. The proposed process for relocation, including schedule for the proposed passive relocation and name of the qualified biologist.

The local jurisdiction, the Implementing Entity, and the Wildlife Agencies will meet to discuss the proposed passive relocation plan. Exceptions will be considered based on, but not limited to, the following factors:

1. The parcel is equal to or less than 3 acres and is more than 1,000 feet from other suitable nesting or foraging habitat such that it is unlikely the site can sustain burrowing owls into the future.
2. If the site has historically been used for nesting (within the last 3 years).
3. If the site is a target for a burrowing owl temporary or permanent management agreement.

As part of the review process, the Implementing Entity and Wildlife Agencies will consider the implications of an exception on the burrowing owl population and progress toward the biological goals and objective of the Plan. A passive relocation exception will not be granted if the Implementing Entity and Wildlife Agencies determine that such an exception, as mitigated, would preclude implementation of the conservation strategy of the Valley Habitat Plan or conflict with other applicable requirements of the Valley Habitat Plan and local policies. The local jurisdiction or the Implementing Entity must make written findings that document these considerations and the rationale for the exception.

Additional mitigation may be required as part of an approval to implement passive relocation that is otherwise prohibited by the Plan. The need for and form of additional mitigation will be determined and approved by the Implementing Entity and Wildlife Agencies. Additional mitigation could include payment of additional fees, or contribution of occupied lands to the Reserve System. Applicable fees may be imposed by the local jurisdiction for processing exception requests. Mitigation will be proportional to the impact occurring as a result of a specific eviction and will fully mitigate such evictions.

The Implementing Entity will compile a list of all exceptions granted each calendar year for inclusion in the annual report to the Wildlife Agencies.

9 Condition 16. Least Bell's Vireo

This condition applies to projects that are located within any riparian forest and scrub land cover type and within Wildlife Survey Area and helps protect least Bell's vireos by prescribing preconstruction surveys, construction buffer zones, biological monitoring, and other requirements.

9.1 Applicable text from Condition 16

To avoid and minimize direct impacts of covered activities on least Bell's vireos, the following procedures will be implemented. These survey requirements provide compliance with the Plan and the MBTA (least Bell's vireo is a listed species, so the HCP permit also serves as a Special Purpose Permit under MBTA; see Chapter 1 for details).

Habitat Survey

Least Bell's vireo surveys will only be required for projects occurring within potential breeding habitat. The Implementing Entity will provide maps showing the geographic regions where surveys may be required. These maps will be updated during the permit term to incorporate best available science on where this species may be found. At the time of Plan adoption, the area of required surveys is limited to the Pajaro watershed, including Uvas, Llagas, and Pacheco sub-watersheds. Projects occurring within the mapped area require surveys if the project-specific verified land cover map (see Section 6.8.3 Item 3: Land Cover Types on Site) shows that the project area is within 250 feet of riparian land cover types. If a project meets this criterion, a qualified biologist will conduct a field investigation to identify and map early successional riparian vegetation (typically dominated by willow shrubs and other thick understory vegetation) which may be used for nesting. If early successional riparian vegetation is found, the project proponent may revise the proposed project to avoid all areas within a 250-foot buffer around the potential nesting habitat and surveys will be concluded.

Preconstruction Survey

If the project proponent chooses not to avoid the potential nesting site and the 250-foot buffer, additional nesting surveys are required. Prior to any ground disturbance related to covered activities, a qualified biologist will:

1. Make his/her best effort to determine if there has been nesting at the site in the past 3 years. This includes checking the CNDDB, contacting local experts, and looking for evidence of historical nesting (i.e., old nests).

2. If no nesting in the past 3 years is evident, conduct a preconstruction survey in areas identified in the habitat survey as supporting potential least Bell's vireo nesting habitat. Surveys will be made at the appropriate times of year when nesting use is expected to occur. The surveys will document the presence or absence of nesting pairs of least Bell's vireo. Protocol-level surveys will be used (USFWS's 2001 least Bell's vireo survey guidelines or latest protocol). Surveys will conclude no more than two calendar days prior to construction.

To avoid last minute changes in schedule or contracting that may occur if an active nest is found, the project proponent may also conduct a preliminary survey up to 14 days before construction. If one or more least Bell's vireo nests are found present (through step 1 or 2 above), the nest site(s) plus a 250-foot buffer will be avoided (see below for additional avoidance and minimization details). The Wildlife Agencies will be notified immediately of nest locations.

Avoidance and Minimization

Covered activities must avoid active least Bell's vireo nests during the breeding season (March 15–July 31) by maintaining at least a 250-foot no-activity buffer around all active nests. As long as the nest remains active, no activity will occur within the established buffer. Disturbance to previous nesting sites (for up to 3 years) will also be avoided during the breeding season unless the disturbance is required for the conservation strategy or to maintain public safety. Least Bell's vireos use previous nesting sites, and disturbance during the breeding season may preclude birds from using existing nests.

The required buffer may be reduced in areas where there are sufficient barriers or topographic relief to protect the nest from excessive noise or other disturbance. Implementing Entity technical staff will coordinate with the Wildlife Agencies and evaluate exceptions to the minimum no-activity buffer distance on a case-by case basis.

Construction Monitoring

If occupied nests are identified, a qualified biologist will monitor construction to ensure that the 250-foot no-activity buffer around all active least Bell's vireo nests is maintained to ensure that covered activities do not affect nest success. If monitoring indicates that construction outside of the buffer is affecting breeding, the buffer will be increased if space allows (e.g., move staging areas farther away). If space does not allow, construction will cease until the young have fledged from the nest or until the end of the breeding season, whichever occurs first. The biological monitor will also conduct training of construction personnel on the avoidance procedures, buffer zones, and protocols in the event that a least Bell's vireo flies into an active construction zone (i.e., outside the buffer zone).

10 Condition 17. Tricolored Blackbird

This condition applies to projects that are located within 250 feet of any riparian, coastal and valley freshwater marsh and helps to protect tricolored blackbirds by prescribing preconstruction surveys, construction buffer zones, biological monitoring, and other requirements.

10.1 Applicable text from Condition 17

To avoid direct impacts of covered activities on nesting tricolored blackbird colonies, the following procedures will be implemented.

Habitat Survey

Projects require surveys if the project-specific verified land cover map (see Section 6.8.3 Item 3: Land Cover Types on Site) shows that the project area is within 250 feet of any riparian, coastal and valley freshwater marsh (perennial wetlands), or pond land cover types. If a project meets this criterion, a qualified biologist will conduct a field investigation to identify and map potential nesting substrate. Nesting substrate generally includes flooded, thorny, or spiny vegetation (e.g., cattails, bulrushes, willows, blackberries, thistles, or nettles). If potential nesting substrate is found, the project proponent may revise the proposed project to avoid all areas within a 250-foot buffer around the potential nesting habitat and surveys will be concluded.

Preconstruction Survey

If the project proponent chooses not to avoid the potential nesting habitat and the 250-foot buffer, additional nesting surveys are required. Prior to any ground disturbance related to covered activities, a qualified biologist will:

1. Make his/her best effort to determine if there has been nesting at the site in the past 5 years. This includes checking the CNDDB, contacting local experts, and looking for evidence of historical nesting (i.e., old nests).
2. If no nesting in the past 5 years is evident, conduct a preconstruction survey in areas identified in the habitat survey as supporting potential tricolored blackbird nesting habitat. Surveys will be made at the appropriate times of year when nesting use is expected to occur. The surveys will document the presence or absence of nesting colonies of tricolored blackbird. Surveys will conclude no more than two calendar days prior to construction.

To avoid last minute changes in schedule or contracting that may occur if an active nest is found, the project proponent may also conduct a preliminary survey up to 14 days before construction. If a tricolored blackbird nesting colony is present (through step 1 or 2 above), a 250-foot buffer will be applied from the outer edge of all hydric vegetation associated with the site and the site plus buffer will be avoided (see below for additional avoidance and minimization details). The Wildlife Agencies will be notified immediately of nest locations.

Avoidance and Minimization

Covered activities must avoid tricolored blackbird nesting habitat that is currently occupied or have been used in the past 5 years. If tricolored blackbird colonies are identified during the breeding season, covered activities will be prohibited within a 250-foot no-activity buffer zone around the outer edge of all hydric vegetation associated with the colony. This buffer may be reduced in areas with dense forest, buildings, or other habitat features between the construction activities and the active nest colony, or where there is sufficient topographic relief to protect the colony from excessive noise or visual disturbance.

Depending on site characteristics, the sensitivity of the colony, and surrounding land uses, the buffer zone may be increased. Land uses potentially affecting a colony will be observed by a qualified biologist to verify that the activity is not disrupting the colony. If it is, the buffer will be increased. Implementing Entity technical staff will coordinate with the Wildlife Agencies and evaluate exceptions to the minimum no-activity buffer distance on a case-by-case basis.

Construction Monitoring

If construction takes place during the breeding season when an active colony is present, a qualified biologist will monitor construction to ensure that the 250-foot buffer zone is enforced. If monitoring indicates that construction outside of the buffer is affecting a breeding colony, the buffer will be increased if space allows (e.g., move staging areas farther away). If space does not allow, construction will cease until the colony abandons the site or until the end of the breeding season, whichever occurs first. The biological monitor will also conduct training of construction personnel on the avoidance procedures, buffer zones, and protocols in the event that tricolored blackbirds fly into an active construction zone (i.e., outside the buffer zone).

11 Condition 18. San Joaquin Kit Fox

This condition applies to projects that are located within any grassland, oak woodland, or agricultural land cover type and within Wildlife Survey Area and helps protect San Joaquin kit foxes by prescribing preconstruction surveys, construction buffer zones, biological monitoring, and other requirements.

11.1 Applicable text from Condition 18

Disturbance of all San Joaquin kit fox dens will be avoided to the maximum extent possible. To avoid or minimize direct impacts of covered activities on San Joaquin kit fox, the following procedures will be implemented. This program was based on USFWS's Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox prior to or during Ground Disturbance (U.S. Fish and Wildlife Service 2011).

Habitat Survey

San Joaquin kit fox surveys will only be required for projects occurring within modeled habitat (Appendix D). (This model will be updated as needed based on best available scientific information.) The Implementing Entity will provide updated modeled habitat maps to the County (the only jurisdiction in which these areas occur). A qualified biologist will conduct a field evaluation of suitable breeding or denning habitat for kit fox for all covered activities that occur within modeled habitat and map potential den sites. If the project does not fully avoid impacts on suitable dens, preconstruction surveys will be required. Suitable breeding habitat is fully avoided if the project footprint does not overlap with a suitable den or with a 250-foot buffer around the suitable den.

Preconstruction Survey

Prior to any ground disturbance related to covered activities, a qualified biologist will conduct a preconstruction survey for covered activities in areas identified by species surveys as being suitable breeding or denning habitat. The surveys will evaluate use of dens by kit foxes using methods appropriate for the northern edge of the species' range, such as placing a tracking medium in the project area where suitable dens occur. Surveys will conclude no more than two calendar days prior to construction. To avoid last minute changes in schedule or contracting that may occur if a kit fox or active den is found, the project proponent may also conduct a preliminary survey up to 14 days before construction. On the parcel where the activity is proposed, the biologist will survey the proposed disturbance footprint and a 250-foot radius from the perimeter of the proposed footprint to identify San Joaquin kit foxes and/or suitable dens. Adjacent parcels under different land ownership will not be surveyed unless access is granted within the 250-foot radius. The status of all dens will be determined and mapped. Written results of preconstruction surveys will be submitted to USFWS and CDFG within two calendar days after survey completion and before the start of ground disturbance.

If San Joaquin kit foxes and/or suitable dens (i.e., dens greater than 5 inches in diameter) are identified in the survey area, the conditions described below will be implemented.

Avoidance and Minimization

The goal of the avoidance and minimization measures for San Joaquin kit fox are to avoid all injury or death to kit fox in the study area, and to minimize harm or harassment to the species. No take authorization for injury or death to kit fox is provided by this Plan due to the rarity of the species in the study area. The following avoidance and minimization conditions will be applied to projects that do not fully avoid suitable dens or kit fox individuals.

- If a suitable San Joaquin kit fox den is discovered in the proposed development footprint, the den will be monitored for 3 days by a USFWS- and CDFG-approved biologist using a tracking medium or an infrared beam camera to determine if the den is currently being used.
- Unoccupied dens will be destroyed immediately to prevent subsequent use. ν If a natal or pupping den is found, USFWS and CDFG will be notified immediately. The den will not be destroyed until the pups and adults have vacated and then only after further consultation with USFWS and CDFG.
- If kit fox activity is observed at the den during the initial monitoring period, the den will be monitored for an additional 5 consecutive days from the time of the first observation to allow any resident animals to move to another den while den use is actively discouraged. For dens other than natal or pupping dens, use of the den can be discouraged by partially plugging the entrance with soil such that any resident animal can easily escape. Once the den is determined to be unoccupied it may be excavated under the direction of the biologist. Alternatively, if the animal is still present after 5 or more consecutive days of plugging and monitoring, the den may have to be excavated by hand when, in the judgment of a biologist, it is temporarily vacant (i.e., during the animal's normal foraging activities). If at any point during excavation a kit fox is discovered inside the den, the excavation activity shall cease immediately and monitoring of the den as described above will be resumed. Destruction of the den may be completed when, in the judgment of the biologist, the animal has escaped from the partially destroyed den.
- Construction and on-going operational requirements from Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox prior to or during Ground Disturbance (U.S. Fish and Wildlife Service 2011) or the latest guidelines will be implemented.

- If active or suitable dens are identified within the proposed disturbance footprint or outside the proposed project footprint but within a 250-foot buffer, exclusion zones around each den entrance or cluster of entrances will be demarcated. The configuration of exclusion zones will be circular, with a radius measured outward from the den entrance(s). No covered activities will occur within the exclusion zones. Exclusion zone radii for atypical dens and suitable dens will be at least 50 feet and will be demarcated with four to five flagged stakes. Exclusion zone radii for known dens will be at least 100 feet and will be demarcated with staking and flagging that encircles each den or cluster of dens but does not prevent access to the den by the foxes.

Construction Monitoring

If construction takes place while kit fox dens are occupied, a qualified biologist will be present to ensure compliance with the avoidance and minimization measures listed above. The frequency of monitoring will be approved by USFWS and CDFG and will be based on the frequency and intensity of construction activities and the likelihood of disturbance to the active dens. In most cases, monitoring will occur at least weekly, but in some cases daily monitoring may be appropriate to ensure that disturbance of San Joaquin kit fox is minimized.

12 Condition 19. Plant Salvage when Impacts are Unavoidable

This condition applies to projects that cannot avoid impacts on covered plants and helps protects covered plants by prescribing salvage whenever avoidance of impacts is not feasible.

12.1.1 Applicable text from Condition 19

Where impacts on covered plant species cannot be avoided and plants will be removed by approved covered activities, the Implementing Entity has the option of salvaging the covered plants. Salvage of covered plants is conducted in addition to mitigation that may be required for impacts on covered plants.

Plant salvage as mitigation is acknowledged as a technique that rarely succeeds; it is opposed by conservation organizations as a primary mitigation tool (Howald 1996; California Native Plant Society 1998). Therefore, the Implementing Entity must carefully weigh the expected costs and potential benefits of the salvage effort before undertaking it. Salvage guidelines are presented below for all covered plants, for perennial species, and for annual species.

All Covered Plants

All salvage operations will be conducted by the Implementing Entity or a third party contractor approved by the Implementing Entity. Translocation activities will be reviewed and approved by the Wildlife Agencies in advance of translocation activities occurring. Translocated plants should be moved during their dormant season in order to minimize impacts to individuals. To ensure enough time to plan salvage operations, project proponents will notify the Implementing Entity of their schedule for removing the covered plant occurrence.

The Implementing Entity may conduct investigations into the efficacy of salvaging seeds from the soil seed bank for both perennial and annual species. The soil seed bank may add to the genetic variability of the occurrence. Covered species may be separated from the soil though garden/greenhouse germination or other appropriate means. Some topsoil taken from impact sites may also be moved to the transplant site in the reserve to introduce soil microorganisms.

The Implementing Entity will transplant new occurrences such that they constitute separate populations and do not become part of an existing population of the species, as measured by the potential for genetic exchange among individuals through pollen or propagule (e.g., seed, fruit) dispersal. Transplanting or seeding receptor sites (i.e., habitat suitable for establishing a new population) will be carefully selected on the basis of physical, biological, and logistical considerations (Fiedler and Laven 1996); some examples of these are listed below.

- Historic range of the species.
- Soil type.
- Soil moisture.
- Topographic position, including slope and aspect.
- Site hydrology.
- Mycorrhizal associates.
- Presence or absence of typical associated plant species.
- Presence or absence of herbivores or plant competitors.
- Site accessibility for establishment, monitoring, and protection from trampling by cattle or trail users.

Perennial Covered Plants

Salvage methods for perennial species will be tested for whole individuals, cuttings, and seeds. Salvage measures will include the evaluation of techniques for transplanting as well as germinating seed in garden or greenhouse and then transplanting to suitable habitat sites in the field. Techniques will be tested for each species, and appropriate methods will be identified through research and adaptive management. Where plants are transplanted or seeds distributed to the field, they will be located in reserves in suitable habitat to establish new populations. Field trials will be conducted to evaluate the efficacy of different methods and determine the best methods to establish new populations. Transplanting within the reserves will only minimally disturb existing native vegetation and soils. Supplemental watering may be provided as necessary to increase the chances of successful establishment, but must be removed following initial population establishment. Supplemental watering will include watering throughout first growing season to mimic natural rainfall patterns. During establishment, areas will be fenced off as necessary to prevent trampling or grazing by livestock. These areas will not be selected for controlled burns. Once the population has established itself, as determined by success criteria that may include setting seed, 3-year survival, or other criteria developed in agreement with the Wildlife Agencies, then fencing and irrigation will be removed and the site may be burned for management purposes if that is appropriate for the target plant.

Annual Covered Plants

For annual covered plants, mature seeds will be collected from all individuals for which impacts cannot be avoided (or if the population is large, a representative sample of individuals). If storage is necessary, seed storage studies will be conducted to determine the best storage techniques for each species. A seed storage facility will also be contacted and consulted regarding collecting and storage requirements of the facility. One of the leading seed banks in California is the Rancho Santa Ana Botanic Garden in Claremont, CA (Rancho Santa Ana Botanic Garden 2010). This facility has strict seed collection and storage guidelines available on its website (http://www.rsabg.org).

If needed, studies will be conducted on seeds germinated and plants grown to maturity in garden or greenhouse to propagate larger numbers of seed. Such studies can be contracted with research

institutions such as the Rancho Santa Ana Botanic Garden, or carried out by other qualified biologists. Seed propagation methods will ensure that genetic variation is not substantially affected by propagation (i.e., selection for plants best adapted to cultivated conditions). Field studies will be conducted under the Adaptive Management Program to determine the efficacy and best approach for dispersal of seed into suitable habitat. Where seeds are distributed to the field, they will be located in reserves in suitable habitat to establish new populations. If seed collection methods fail (e.g., due to excessive seed predation by insects), alternative propagation techniques will be necessary.

13 Condition 20. Avoid and Minimize Impacts to Covered Plant Occurrences

This condition applies to projects that are located in areas where covered plant species are likely to occur and within a covered plant survey area; this condition helps protect certain plant species by requiring plant surveys, specific avoidance and minimization practices (e.g., using seclusion fencing), and monitoring.

13.1 Applicable text from Condition 20

Almost all known occurrences of covered plants in the study area are outside the planning limits of urban growth and outside the footprint of covered activities. Many of these occurrences are expected to be included in the Reserve System. However, uncertainty remains regarding impacts on covered plants because of the lack of surveys in many areas, the general nature of some plant occurrence data, and the uncertainty in the location of some covered activities. To account for this uncertainty, impacts on covered plants are tracked by occurrence21 , as described in Chapter 4. To ensure compliance with the requirements in Chapter 5, surveys for covered plants will be conducted in certain areas in order to 1) identify occurrences of covered plants, and 2) assess the condition of these occurrences.

Covered Plant Surveys

To ensure that plants are adequately conserved relative to impacts of covered activities, plant surveys will identify occurrences of covered plants that may be affected by covered activities (see Section 5.3.1 Land Acquisition and Restoration Actions subheading Incorporating Covered Plant Species). Surveys are required in locations where covered plant occurrences are most likely to occur. Covered plant surveys will be required in the following land cover types and specific habitats. The plant species for which surveys are required are also indicated. These land cover types and habitats were identified because the majority of covered species occur primarily or exclusively in serpentine land cover types.

- Serpentine bunchgrass grassland: Survey for smooth lessingia, fragrant fritillary, Metcalf canyon jewelflower, most beautiful jewelflower, Tiburon paintbrush, and Coyote ceanothus.
- Serpentine rock outcrop: Survey for Santa Clara Valley dudleya, smooth lessingia, Metcalf canyon jewelflower, most beautiful jewelflower, and Tiburon paintbrush. ν Serpentine seep: Survey for Mount Hamilton thistle.
- Mixed serpentine chaparral: Survey for Coyote ceanothus and most beautiful jewelflower. ν Mixed oak woodland and forest with serpentine soils: Survey for Loma Prieta hoita.
- Coast live oak forest and woodland with serpentine soils: Survey for Loma Prieta hoita. ν Northern coastal scrub and Diablan sage scrub with serpentine soils: Survey for Coyote ceanothus, Metcalf canyon jewelflower, most beautiful jewelflower, and smooth lessingia.

Plant surveys will also be required in suitable habitat within a 0.25 mile (1,320 feet) radius of a known occurrence of a covered plant to ensure that known occurrences are located (in most cases,

these survey areas will overlap with the land cover types listed above). The Implementing Entity will maintain a map of known occurrences and the survey radius around each one based on this Plan and updates provided by the CNDDB (every six months) for the study area.

These surveys will be performed according to the current applicable guidelines of CDFG and/or USFWS for plant surveys (if available) except no floristic surveys are required. The appropriate survey period for each covered plant species is described in Table 6-922 . Surveys must be conducted at the time of year when the species can be identified in the field. In some cases, plants may be identifiable outside of the flowering period (e.g., Mount Hamilton thistle, Coyote ceanothus).

Inside the urban service area, surveys for covered plants will occur in land cover types and habitats listed above within the area on which the land cover fee will be levied and in any other areas where indirect effects could occur. The survey area must include buffers around structure where required vegetation clearing will occur to meet state and local fuel reduction regulations.

If a covered plant occurrence is observed on site, the condition of this occurrence must be described in the application package according to the guidelines in Chapter 5, Section 5.3.1 Land Acquisition and Restoration Activities subheading Incorporating Covered Plant Species. The condition of each covered plant occurrence must be documented as a baseline to compare future monitoring (if necessary) and to ensure that occurrences are protected within the Reserve System that are in as good or better condition than those lost to covered activities.

If a covered plant occurrence is found on the project site, the local jurisdiction will obtain the opinion of a qualified biologist regarding the projected long-term viability of a covered plant occurrence given the plant occurrence condition, site conditions, and project-level construction details. The qualified biologist will make this determination based on best available scientific information. In cases where it is difficult to project long-term viability, the qualified biologist will conservatively error in favor of the covered plant and assume that long-term viability will be reduced and the occurrence will be considered lost for tracking purposes. Impacts to covered plants will be avoided or minimized wherever possible by implementing the following conditions.

Avoidance and Minimization

In order to reduce impacts to covered plants, all covered activities will be confined to the minimum area necessary to complete the activity or construction. A setback buffer will be established around covered plant occurrences located on any project site or in an adjacent area that could be affected by construction traffic or activities. The setback buffer will be adequate to prevent or minimize impacts during or after project implementation. The plants and buffer area will be protected from encroachment and damage during construction by installing temporary construction fencing. Fencing will be bright-colored and highly visible. Fencing will be designed to keep construction equipment away from plants and prevent unnecessary damage to or loss of plants on the project site. Fencing will be installed under the supervision of a qualified biologist to ensure proper location and prevent damage to plants during installation. Fencing will be installed before any site preparation or construction work begins and will remain in place for the duration of construction. Construction personnel will be prohibited from entering these areas (the exclusion zone) for the duration of project construction.

Site Monitoring, Assessment, and Management

If a qualified biologist determines that the long-term viability of a covered plant occurrence will be reduced (as described below) by implementation of covered activities, the loss must be offset by protection, management, and monitoring of covered plant occurrences in the Reserve System prior to impacts (Table 5-16).

Some covered plant occurrences may only be disturbed or partially affected by covered activities, and viability may be maintained. It is important to monitor and, if possible, maintain these occurrences of covered plants where they occur, even if they are not protected within the Reserve System. Covered plant occurrences that are determined to be partially permanently affected by a qualified biologist (i.e., only a portion of the occurrence is impacted) by covered activities will be monitored by the Implementing Entity. The purpose of the monitoring will be 1) to assess whether the impact reduces the long-term viability of the occurrence and whether supplemental management actions are feasible and warranted, and 2) to determine whether the Implementing Entity must protect and enhance or create occurrences in the Reserve System according to Table 5-16. If the impact occurs to less than 5% of the total occurrence as measured by the number of individuals at the time of impact, then the impact is assumed not to affect long-term viability and will not require monitoring nor will it count as a permanent impact (Table 4-6). This allowance does not apply to Coyote ceanothus.

When determining viability for the purpose of assessing a partial or permanent impact, the Implementing Entity will consider the following factors.

1. Results of monitoring plant occurrences affected by covered activities (e.g., correlation between pre-project observations and actual viability post project).
2. Impacts to date to the covered plant species and how close total impacts are to the allowable impact cap in the Plan (e.g., extra care taken when near cap not to exceed the cap).

Specific monitoring protocols and success criteria will be developed during implementation as appropriate for each covered species, according to the guidelines discussed here. Monitoring protocols can draw on those developed for other HCP/NCCPs. It is possible that only a portion of the occurrence will be located on the covered activity project site. In such instances, the monitoring protocol will address this issue. Three possible approaches include the following.

1. If the landowner agrees, the Implementing Entity will obtain access to the adjacent sites on which the rest of the plant occurrence is located, and surveys will include the entire occurrence.
2. If access to adjacent site(s) is not possible, or if for some other reason it is not feasible to survey the entire occurrence, then an alternative will be developed to estimate the extent and condition of the adjacent portion of the occurrence.
3. If only a small portion of the occurrence is on adjacent properties, then only the portion of the occurrence on the project site will be monitored and assessed for viability. The determination whether this is a full impact will be made based on the results for this portion of the occurrence only.

4. Population monitoring will be conducted by the Implementing Entity before the covered activity is implemented to document the baseline condition. For annual species, the minimum post-construction monitoring period will be 5 years. If extreme or unusual climate conditions affect the species, then monitoring will be extended 1 or 2 years, as appropriate to assess impacts and success. Monitoring will include estimates of percent cover and number of individuals. An occurrence will be assumed to retain long-term viability and will not require replacement in the Reserve System if the decline in occurrence size and percent cover from pre-project conditions is less than 25% over the monitoring period, unless site-specific conditions otherwise suggest substantial declines in occurrence viability.

For perennial species, the minimum post-construction monitoring period will be 3 years. Monitoring will include estimates of density (percent cover), recruitment of seedlings if impacts included removing individuals, and measurements of adult plant health (e.g., signs of disease, herbivory, nutrient deficiencies, etc.). An occurrence of a perennial covered species will be assumed to retain long-term viability and will not require replacement in the reserve system if the decline in seedling recruitment and density from pre-project conditions is less than 25% over the monitoring period, unless site-specific conditions otherwise suggest substantial declines in occurrence viability.

The Implementing Entity will implement conservation actions on the site that would help to maintain or improve the condition of the occurrence, as long as an agreement can be reached with the landowner to conduct these measures. Possible conservation measures are described in Chapter 5. If plant occurrences are determined to not be viable based on post-project monitoring, the Implementing Entity must assess the loss as a full permanent impact and implement conservation actions accordingly. In these cases, mitigation would occur after the impact. However, the potential for mitigation to occur after impacts is unlikely given that the qualified biologist and Implementing Entity will make conservative determinations regarding projected impacts on long-term viability.

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

Public Draft Initial Study/Mitigated Negative Declaration

Appendix C:

Air Quality/GHG

Table XX. Equipment Related Emissions of Criteria Air Pollutants

Emission Source	Average Daily Emissions (lbs/day)			
	ROG	NOX	PM10 (Exhaust)	PM2.5 (Exhaust)
Heavy-Duty Equipment	1.00	9.47	0.31	0.28
Mobile Sources	0.13	0.92	0.00	0.00
Helicopter	8.54	35.17	0.96	0.96*
Boat & Barge	0.19	0.03	0.02	0.01
Total	**9.85**	**45.59**	**1.29**	**0.30**
Thresholds of Significance	54	54	82	54
Exceed?	NO	NO	NO	NO

Table XX . Equipment Related Emission of GHGs

Emission Source	GHG Emissions
	MT CO2e/Year
Heavy-Duty Equipment	237
Mobile Sources	44
Helicopter	538
Boat & Barge	0.025
Total	820

Equipment Use Inputs

Table 2-4 - Proposed Project Equipment and Duration of Use				Equipment Use Calculations and Assumptions									
Equipment	**Estimated Maximum Pieces**	**#of Days**	**Hours of Use per Day**	**Number Equip.**	**Work Days**	**Avg. Hours/Day**	**Total Equipment Hours**	**Round Trip Length (mi) within**	**Num. Round Trips/Vehic**	**Total Trips**	**Total Mileage**	**Onroad**	**Onsite**
Drill Rig Mobilization and	2	6 days round trip	8 per day	2	6	NA	NA	10.2	1	12	122.4	1	0
Drill Rig Mobilization and	2	6 days round trip	8 per day	2	6	NA	NA	10.2	1	12	122.4	1	0
Drill Rig Mobilization and	1	2 days round trip	4 per day	1	2	NA	NA	10.2	1	2	20.4	1	0
Water Truck (2000 gallon)	1	120 truck days	24 miles (2 round trips/day)	1	120	NA	NA	12	2	240	2880	1	0
Helicopter (Bell Jet Ranger)	1	Base 92 days Sup 36 days	4 onsite plus 50 miles round trip to Hollister Airport	1	128	4	512	28.9	1	128	3697.8	0	0
Helicopter Fuel Truck (F650)	1	Base 92 days Sup 36 days	50 miles round trip to Hollister Airport	1	128	NA	NA	37.2	1	128	4761.6	1	0
Crew Transport Vehicles	8	1,800 vehicle days	60 miles round trip/day from Gilroy to the	8	225	NA	NA	60	1	1800	108000	1	0
Barge and Support Boat*	1 of each	15 days each	1 hour each day	1	15	1	15	NA	NA	NA	NA	0	1
Chainsaw	1	3 saw days	8 total for the entire project	1	3	NA	8	NA	NA	NA	NA	0	1
ATV	2	100 vehicle days	1	2	100	1	100	NA	NA	NA	1500	1	1
Drill Rig (drill rigs may be mounted on trucks or large utility trailers.	5	496 rig days (Base 366 rig days Supplemental 120 rig	8 for Weekdays, 6 for Saturdays (includes hours for truck mounted drill or truck pulling drill rig on trailer)	5	97.2	7	3402	NA	NA	NA	NA	0	1
Excavator	1	16 days	5 hrs/day excavator run time	1	16	5	80	NA	NA	NA	NA	0	1
Pump	2	260 pump days	3 hrs/day pump time	2	130	3	390	NA	NA	NA	NA	0	1
Notes: * If necessary, based on water levels; this would reduce the amount of track-based drilling days by 15 days.													

Red are deviates from Table 2-4 based on update information from email correspondance with the applicant on Dec 6, 2023.

Notes and assumptions:

120 The number of total work days, estimated as 20 wks x 6 days/wk according to project schedule.

57.78% Percentage of miles that locate within BAAQMD region between project site and Hollister Airport based on measurement using Google Earth.

15 Assumed speed in mile/h for onsite vehicles to estimate VMT.

Deviations from calculation are based on email correspondence with applicant.

4.2666667 Adjusted Helicopter average hours by dividing total helicopter hours by the number of total work days = 512/120.

Equipment Exhaust Emissions

Equipment	Total Equipment Hours	Work Days	ROG	NOX	CO	PM10	PM2.5	CO2e	CO2e
			lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	MT/year
Chainsaw	8	120	0.00	0.01	0.02	0.00	0.00	2	0.11
ATV	100	120	0.01	0.05	0.43	0.00	0.00	28	1.50
Drill Rig (drill rigs may be mounted on trucks or large utility trailers.	3402	120	0.94	9.08	8.60	0.29	0.27	4,282	233.07
Excavator	80	120	0.01	0.07	0.08	0.00	0.00	12	0.64
Pump	390	120	0.03	0.25	0.18	0.01	0.01	33	1.81
		Total	1.00	9.47	9.31	0.31	0.28	4,357	237

		Unit
Mass Conversion Rates	453.59	g/lb
	1000000	g/MT
	2205	lb/MT

Notes:
Although there is an reduction on drill days estimated emission reduction of drill rig emissions based on the reduction of drilling days when boat and barge are used.
Above calculation used the Emission Rates below.

Equipment Exhaust Emission Rates

Clients Equipment List	Modeled Equipment	Horsepower	Load Factor	ROG	NOX	CO	PM10	PM2.5	CO2	CH4	N2O	CO2e	Equipment/Source Used to Model Horse Power
				g/h	g/h	g/h	g/h	g/h	g/h	g/h	g/h	g/h	
Chainsaw	Concrete/Industr	33	0.73	11.3223	90.19296	105.5383	2.81853	2.60172	13849.46	0.55407	0.12045	13,900	CalEEMod default
Excavator	Excavators	36	0.38	5.6772	47.89368	57.41496	1.62792	1.5048	8034.497	0.32832	0.0684	8,058	CalEEMod default
Pump	Pump	11	0.74	4.72934	35.5311	24.51768	1.5059	1.3838	4625.986	0.18722	0.0407	4,640	CalEEMod default
Drill Rig (drill rigs may be mounted o	Bore/Drill Rigs	260	0.5	15.08	145.34	137.54	4.68	4.29	68239.86	2.73	0.52	68,510	Assume the same drill used in the PREP EIR: 4” Air Track Drill
ATV	ATV	89	0.53	8.08655774	25.4548621	236.1276	1.132061	1.0414964				15,049	https://www.polaris.com/en-us/off-road/atv-4-wheeler/

Note: No data for ATV Load Factor, surrogated by CalEEMod default load factor for gasoline-fueled "Other Material Handling Equipment".

Equipment Emission Factors

Table G-11. Statewide Average Annual Offroad Equipment Emission Factors (grams per horsepower-hour)

Equipment	Year	Fuel	Low HP	High H	TOG	ROG	NOX	CO	PM10	PM2.5	CO2	CH4	N2O	GHGs EF (g/hp-hr) CO2e
Concrete/Industrial Saws	2024	Diesel	25	50	0.569	0.470	3.744	4.381	0.117	0.108	574.905	0.023	0.005	577
Excavators	2024	Diesel	25	50	0.494	0.415	3.501	4.197	0.119	0.110	587.317	0.024	0.005	589
Pumps	2024	Diesel	0	25	0.703	0.581	4.365	3.012	0.185	0.17	568.303	0.023	0.005	570
Bore/Drill Rigs	2024	Diesel	175	300	0.138	0.116	1.118	1.058	0.036	0.033	524.922	0.021	0.004	527

Source: CalEEMod 2022 Appendix G

GWP values used for the calcuation of CO2e

100-yr	GWP
CO2	1
CH4	25
N2O	298

Source: IPCC Fourth Assessment Report: Climate Change 2007, 2.10.2 Direct Global Warming Potentials

Offroad - ATV Emission Factor Calculation

Model Output: OFFROAD2021 (v1.0.5) Emissions Inventory
Region Type: Air District
Region: Bay Area AQMD
Calendar Year: 2024
Scenario: All Adopted Rules - Exhaust
Vehicle Classification: OFFROAD2021 Equipment Types
Units: tons/day for Emissions, gallons/year for Fuel, hours/year for Activity, Horsepower-hours/year for Horsepower-hours

Region	Calendar Y	Vehicle Cat	Model Yea	Horse	Fuel	HC_tpd	ROG_tpd	TOG_tpd	CO_tpd	NOx_tpd	CO2_tpd	PM10_tpd	PM2.5_tpd	SOx_tpd	NH3_tpd	Fuel Consu	Total_Activ	Total_Popu	Horsepower_Hours_hhpy
Bay Area A	2024	Agricultura	Aggregate	100	Gasoline	0.00071	0.000859	0.001022	0.025077	0.002703	1.598188	0.00012	0.000111	1.45E-05	1.3E-05	51795.65	2467.503	65.85875	1658745
Bay Area A	2024	Agricultura	Aggregate	50	Gasoline	0.001906	0.002306	0.002745	0.093691	0.004877	2.777791	0.000209	0.000192	2.53E-05	2.26E-05	90025.36	10397.72	309.9204	2883044
Bay Area A	2024	Agricultura	Aggregate	75	Gasoline	0.000526	0.000637	0.000758	0.024669	0.001436	0.864928	6.51E-05	5.99E-05	7.87E-06	7.05E-06	28031.45	4822.2	52.16311	897701.3

907185 grams/ton
365 days/year

					ATV Emission Factor	**HC**	**ROG**	**TOG**	**CO**	**NOX**	**CO2e**	**PM10**	**PM2.5**	**SOx**	**NH3**
Region	Calendar Y	Vehicle Cat	Model Yea	Horse	Fuel	g/hp-hr	g/hp-hr	g/hp-hr	g/hp-hr	g/hp-hr	g/hp-hr	g/hp-hr	g/hp-hr	g/hp-hr	g/hp-hr
Bay Area A	2024	Agricultura	Aggregate	100	Gasoline	0.141681	0.171434	0.204021	5.005886	0.539641	319.0341	0.024	0.02208	0.002903	0.002601

Note: Used CO2 for CO2e.

On-Road Exhaust Emissions

Onroad Vehicle Trips

Equipment	Total VMT	Total Trips	Total Work Days	Number of Vehicles	Trip Type	Vehicle Types
Drill Rig Mobilization and Demobilization from Spokane Washington (950 miles)	122	12	120	2	Haul 1	HHDT
Drill Rig Mobilization and Demobilization from Clark Fork, Idaho (1,050)	122	12	120	2	Haul 2	HHDT
Drill Rig Mobilization and Demobilization from West Sacramento, California *135)	20	2	120	1	Haul 3	HHDT
Water Truck (2000 gallon)	2880	240	120	1	Vendor 1	MHDT
Helicopter Fuel Truck (F650)	4762	128	120	1	Vendor 2	MHDT
Crew Transport Vehicles	108000	1800	120	8	Worker	LDA,LDT1, LDT2

EMFAC Emission Types Used to Estimate Onroad Emission Rates

Pollutant group	VMT-based (g/mile)	Trip-based (g/trip)	Idle/Diurnal-based (g/vehicle/day)
TOG, ROG	RUNEX	STREX, HOTSOAK, RUNLOSS	IDLEX, DIURN
Gases	RUNEX	STREX	IDLEX
PM - Exhaust	RUNEX	STREX	IDLEX
PM - Dust	PMTW, PMBW		

EMFAC2021 Acronyms		
RUNEX	Running exhaust	g/mile
PMBW	PM brakewear	g/mile
PMTW	PM tirewear	g/mile
STREX	Start exhaust	g/trip
HOTSOAK	Hot Soak evaporative	g/trip
RUNLOSS	Running Loss evaporative	g/trip
IDLEX	Idle exhaust	g/trip
DIURN	Diurnal Loss evaporative	g/trip

VMT-based emission rate (g/miles)

Vehicle Category	Fuel	ROG	NOx	PM10_Ex	PM2.5_Ex	PM10_D	PM2.5_D	CO	CO2	CH4	N2O	CO2e
LDA	Gasoline	0.00915773	0.0432846	0.00130447	0.001199407	0.01532238	0.00456283	0.7243982	277.2970776	0.002379	0.00472715	278.7652
LDA	Diesel	0.02912728	0.2266647	0.01839683	0.017600996	0.01550841	0.00462794	0.34958945	237.5206877	0.001353	0.037421481	248.7061
LDT1	Gasoline	0.02669835	0.1254235	0.0018723	0.001721538	0.0169589	0.00513561	1.35787102	329.4377608	0.006026	0.009291582	332.3573
LDT1	Diesel	0.30453034	1.6307715	0.25034396	0.239514193	0.01856338	0.00569718	1.6946026	420.6566494	0.014145	0.066274626	440.7601
LDT2	Gasoline	0.01069916	0.0653976	0.00134873	0.001240111	0.01659935	0.00500977	0.79776317	340.9798583	0.002753	0.005760212	342.7652
LDT2	Diesel	0.0137167	0.0465951	0.00524256	0.005015774	0.01665559	0.00502946	0.13810128	314.9866554	0.000637	0.049626276	329.7912
MHDT	Gasoline	0.07547613	0.4757249	0.00142861	0.001313551	0.05701744	0.0187561	1.57696657	1784.35698	0.015154	0.02319661	1791.648
MHDT	Diesel	0.03082412	1.2187071	0.01421363	0.013598756	0.05757557	0.01895145	0.11623971	1148.147174	0.001432	0.180891055	1202.089
HHDT	Gasoline	0.74787953	4.8144424	0.00175173	0.001610654	0.11111843	0.03689145	37.2969374	2278.06224	0.140325	0.166787487	2331.273
HHDT	Diesel	0.01737049	1.9406828	0.02732235	0.026140395	0.11418338	0.03644454	0.08459214	1635.218828	0.000807	0.257629392	1712.013

Trip-based emission rate (g/trip)

Vehicle Category	Fuel	ROG	NOx	PM10_Ex	PM2.5_Ex	PM10_D	PM2.5_D	CO	CO2	CH4	N2O	CO2e
LDA	Gasoline	0.67834302	0.2651558	0.00212358	0.001952554	0	0	3.35564774	70.47021729	0.073795	0.033531307	82.30743
LDA	Diesel	0	0	0	0	0	0	0	0	0	0	0
LDT1	Gasoline	1.23641791	0.3982458	0.00297453	0.002735029	0	0	5.51755639	87.20086303	0.109518	0.039592558	101.7374
LDT1	Diesel	0	0	0	0	0	0	0	0	0	0	0
LDT2	Gasoline	0.67943196	0.3327951	0.00213302	0.001961236	0	0	3.70824564	87.12353711	0.08309	0.037309505	100.319
LDT2	Diesel	0	0	0	0	0	0	0	0	0	0	0
MHDT	Gasoline	0.58233013	0.4415196	0.0005588	0.000513798	0	0	5.78903596	46.4458254	0.04778	0.032969915	57.46537
MHDT	Diesel	0	1.6448622	0	0	0	0	0	0	0	0	0
HHDT	Gasoline	0.71476123	0.4555874	0.00101477	0.00093304	0	0	4.47923336	53.32908453	0.000105	0.010885821	56.57569
HHDT	Diesel	0	2.8905888	0	0	0	0	0	0	0	0	0

Idle/Diurnal-based emission rate (g/vehicle/trip)

Vehicle Category	Fuel	ROG	NOx	PM10_Ex	PM2.5_Ex	PM10_D	PM2.5_D	CO	CO2	CH4	N2O	CO2e
LDA	Gasoline	1.46380341	0	0	0	0	0	0	0	0	0	0
LDA	Diesel	0	0	0	0	0	0	0	0	0	0	0
LDT1	Gasoline	2.74540765	0	0	0	0	0	0	0	0	0	0
LDT1	Diesel	0	0	0	0	0	0	0	0	0	0	0
LDT2	Gasoline	1.32538631	0	0	0	0	0	0	0	0	0	0
LDT2	Diesel	0	0	0	0	0	0	0	0	0	0	0
MHDT	Gasoline	3.77842638	0.0885098	0	0	0	0	15.1205738	535.3328997	0.259204	0.007300989	543.9887
MHDT	Diesel	0.24474827	13.25553	0.02944171	0.028168073	0	0	7.51715737	2255.87769	0.011368	0.355414449	2362.075
HHDT	Gasoline	4.95693611	0	0	0	0	0	0	0	0	0	0
HHDT	Diesel	5.11587862	62.828008	0.03305456	0.031624633	0	0	74.3228516	12060.68317	0.237619	1.900165545	12632.87

GWP values used for the calcuation of CO2e

100-yr	GWP
CO2	1
CH4	25
N2O	298

Source: IPCC Fourth Assessment Report: Climate Change 2007, 2.10.2 Direct Global Warming Potentials

Worker Fleet Composition

		VMT-based		Trip-based	
Vehicle Category	Fuel	VMT	Type Composition	Trips	Type Composition
LDA	Gasoline	81147747.2	63%	10281548.5	63%
LDA	Diesel	244715.213	0%	36778.8401	0%
LDT1	Gasoline	7025840.7	5%	957650.444	6%
LDT1	Diesel	1390.27444	0%	324.50127	0%
LDT2	Gasoline	40249114.8	31%	5078713.72	31%
LDT2	Diesel	164521.828	0%	20593.1663	0%
	Total	128833330	100%	16375609.2	100%

Vendor Fleet Composition: MHDT, Diesel

Haul Fleet Composition: HHDT, Diesel

Exhaust Emission - Worker

Emisson Factors	ROG	NOx	PM10_Ex	PM2.5_Ex	PM10_D	PM2.5_D	CO	CO2e	Units
VMT -	0.011	0.055	0.001	0.001	0.016	0.005	0.780	301.692	g/mile
Trip -	0.708927107	0.29298229	0.0021688	0.00199413	0	0	3.57960811	88.7398007	g/trip
Evaporative -	1.490666028	0	0	0	0	0	0	0	g/day/vehicle

Avg. Mass Emission Rate	ROG	NOx	PM10_Ex	PM2.5_Ex	PM10_D	PM2.5_D	CO	CO2e	Units
VMT -	0.02112	0.10921	0.00276	0.00254	0.03137	0.00939	1.54847	598.60539	lbs/day
Trip -	0.023443751	0.00968873	7.172E-05	6.5944E-05	0	0	0.11837528	2.93456658	lbs/day
Evaporative -	0.026290848	0	0	0	0	0	0	0	lbs/day
Total	**0.0709**	**0.1189**	**0.0028**	**0.0026**	**0.0314**	**0.0094**	**1.6668**	**601.5400**	**lbs/day**

Exhaust Emission - Vendor

Emisson Factors	ROG	NOx	PM10_Ex	PM2.5_Ex	PM10_D	PM2.5_D	CO	CO2e	Units
VMT -	0.031	1.219	0.014	0.014	0.058	0.019	0.116	1202.089	g/mile
Trip -	0	1.64486217	0	0	0	0	0	0	g/trip
Evaporative -	0.244748273	13.2555297	0.0294417	0.02816807	7.517157367	2255.87769			g/day/vehicle

Avg. Mass Emission Rate	ROG	NOx	PM10_Ex	PM2.5_Ex	PM10_D	PM2.5_D	CO	CO2e	Units
VMT -	0.00163	0.06448	0.00075	0.00072	0.00305	0.00100	0.00615	63.60364	lbs/day
Trip -	0	0.0072526	0	0	0	0	0	0	lbs/day
Evaporative -	0.000539578	0.02922344	6.491E-05	6.21E-05	0.016572495	4.97335899	0	0	lbs/day
Total	**0.0022**	**0.1010**	**0.0008**	**0.0008**	**0.0196**	**4.9744**	**0.0062**	**63.6036**	**lbs/day**

Exhaust Emission - Hauling

Emisson Factors	ROG	NOx	PM10_Ex	PM2.5_Ex	PM10_D	PM2.5_D	CO	CO2e	Units
VMT -	0.018	1.943	0.027	0.026	0.114	0.036	0.101	1713.050	g/mile
Trip -	0	2.89058884	0	0	0	0	0	0	g/trip
Evaporative -	5.115878616	62.8280083	0.0330546	0.03162463	0	0	74.3228516	12632.873	g/day/vehicle

Haul 1

Avg. Mass Emission Rate	ROG	NOx	PM10_Ex	PM2.5_Ex	PM10_D	PM2.5_D	CO	CO2e	Units
VMT -	0.00004	0.00437	0.00006	0.00006	0.00026	0.00008	0.00023	3.85216	lbs/day
Trip -	0	0.00063727	0	0	0	0	0	0	lbs/day
Evaporative -	0.022557163	0.2770241	0.0001457	0.00013944	0	0	0.32770768	55.7014351	lbs/day
Total	**0.0226**	**0.2820**	**0.0002**	**0.0002**	**0.0003**	**0.0001**	**0.3279**	**59.5536**	**lbs/day**
Haul 2 (same as Haul 1)	**0.0226**	**0.2820**	**0.0002**	**0.0002**	**0.0003**	**0.0001**	**0.3279**	**59.5536**	**lbs/day**
Haul 3									
Avg. Mass Emission Rate	ROG	NOx	PM10_Ex	PM2.5_Ex	PM10_D	PM2.5_D	CO	CO2e	Units
VMT -	0.00001	0.00073	0.00001	0.00001	0.00004	0.00001	0.00004	0.64203	lbs/day
Trip -	0	0.00010621	0	0	0	0	0	0	lbs/day
Evaporative -	0.011278582	0.13851205	7.287E-05	6.972E-05	0	0	0.16385384	27.8507176	lbs/day
Total	**0.0113**	**0.1393**	**0.0001**	**0.0001**	**0.0000**	**0.0000**	**0.1639**	**28.4927**	**lbs/day**
Total of all haul trucks	**0.0565**	**0.7034**	**0.0005**	**0.0005**	**0.0006**	**0.0002**	**0.8198**	**147.5999**	**lbs/day**

	ROG	NOx	PM10_Ex	PM2.5_Ex	PM10_D	PM2.5_D	CO	CO2e	Units
Summed Onroad Emission Avg D	**0.1295**	**0.9233**	**0.0041**	**0.0039**	**0.0516**	**4.9839**	**2.4928**	**812.7435**	lbs/day
								44	Tons/year

Conversion

453.59	g/lb	onlineconversion.com/weight_common.htm
2204.62	lb/Metric ton	

Notes

Assumed 100% of OnRoad Emission occurs on paved road.
Emission Type -Specific Emission rates are provided in worksheet EMFAC2021

Source: EMFAC2021 (v1.0.2) Emission Rates
Region Type: Air District
Region: Bay Area AQMD
Calendar Year: 2024
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Units: miles/day for CVMT and EVMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX,

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	Population	Total VMT	CVMT	EVMT
Bay Area	2024	LDA	Aggregat	Aggregat	Gasoline	2219777.687	81147747.2	81147747.2	0
Bay Area	2024	LDA	Aggregat	Aggregat	Diesel	8722.612794	244715.2135	244715.2135	0
Bay Area	2024	LDT1	Aggregat	Aggregat	Gasoline	215880.1127	7025840.701	7025840.701	0
Bay Area	2024	LDT1	Aggregat	Aggregat	Diesel	114.167496	1390.274445	1390.274445	0
Bay Area	2024	LDT2	Aggregat	Aggregat	Gasoline	1083576.445	40249114.81	40249114.81	0
Bay Area	2024	LDT2	Aggregat	Aggregat	Diesel	4342.827659	164521.8277	164521.8277	0
Bay Area	2024	MHDT	Aggregat	Aggregat	Gasoline	6547.895011	341692.7703	341692.7703	0
Bay Area	2024	MHDT	Aggregat	Aggregat	Diesel	47001.62895	1982083.925	1982083.925	0
Bay Area	2024	HHDT	Aggregat	Aggregat	Gasoline	19.88638123	1895.942734	1895.942734	0
Bay Area	2024	HHDT	Aggregat	Aggregat	Diesel	36152.7636	4258422.333	4258422.333	0

HOTSOAK and RUNLOSS, g/vehicle/day for IDLEX and DIURN. PHEV calculated based on total VMT.

Trips	NOx_RUNEX	NOx_IDLEX	NOx_STREX	PM2.5_RUNE	PM2.5_IDLEX	PM2.5_STREX	PM2.5_PMT	PM2.5_P	PM10_RU	PM10_IDL	PM10_ST	PM10_P
10281548.48	0.0433	0	0.2652	0.0012	0	0.002	0.002	0	0	0	0	0.01
36778.8401	0.2267	0	0	0.0176	0	0	0.002	0	0.02	0	0	0.01
957650.4441	0.1254	0	0.3982	0.0017	0	0.0027	0.002	0	0	0	0	0.01
324.5012702	1.6308	0	0	0.2395	0	0	0.002	0	0.25	0	0	0.01
5078713.724	0.0654	0	0.3328	0.0012	0	0.002	0.002	0	0	0	0	0.01
20593.16635	0.0466	0	0	0.005	0	0	0.002	0	0.01	0	0	0.01
131010.2834	0.4757	0.0885	0.4415	0.0013	0	0.0005	0.003	0.02	0	0	0	0.01
559339.0577	1.2187	13.256	1.6449	0.0136	0.0282	0	0.003	0.02	0.01	0.03	0	0.01
397.8867157	4.8144	0	0.4556	0.0016	0	0.0009	0.005	0.03	0	0	0	0.02
530131.3944	1.9407	62.828	2.8906	0.0261	0.0316	0	0.0088	0.03	0.03	0.03	0	0.04

PM10_P	CO2_RUNE	CO2_IDLEX	CO2_STRE	CH4_RUNE	CH4_IDLEX	CH4_STRE	N2O_RUNE	N2O_IDLEX	N2O_STRE	ROG_RUNE	ROG_IDLEX	ROG_STRE	ROG_HOTS	ROG_RUNL	ROG_DIUR	TOG_RUNE
0.01	277	0	70.5	0	0	0.07	0	0	0.03	0.01	0	0.34	0.09	0.24	1.46	0.01
0.01	238	0	0	0	0	0	0.04	0	0	0.03	0	0	0	0	0	0.03
0.01	329	0	87.2	0.01	0	0.11	0.01	0	0.04	0.03	0	0.57	0.17	0.5	2.75	0.04
0.01	421	0	0	0.01	0	0	0.07	0	0	0.3	0	0	0	0	0	0.35
0.01	341	0	87.1	0	0	0.08	0.01	0	0.04	0.01	0	0.38	0.08	0.21	1.33	0.02
0.01	315	0	0	0	0	0	0.05	0	0	0.01	0	0	0	0	0	0.02
0.05	1784	535	46.4	0.02	0.26	0.05	0.02	0.01	0.03	0.08	1.01	0.27	0.03	0.28	2.77	0.11
0.05	1148	2256	0	0	0.01	0	0.18	0.36	0	0.03	0.24	0	0	0	0	0.04
0.09	2278	0	53.3	0.14	0	0	0.17	0	0.01	0.75	0	0	0.07	0.64	4.96	1.09
0.08	1635	####	0	0	0.24	0	0.26	1.9	0	0.02	5.12	0	0	0	0	0.02

TOG_IDLEX	TOG_STRE	TOG_HOTS	TOG_RUNL	TOG_DIUR	NH3_RUNE	CO_RUNEX	CO_IDLEX	CO_STREX	SOx_RUNE	SOx_IDLEX	SOx_STRE
0	0.37	0.09	0.24	1.46	0.03	0.72	0	3.36	0	0	0
0	0	0	0	0	0	0.35	0	0	0	0	0
0	0.62	0.17	0.5	2.75	0.04	1.36	0	5.52	0	0	0
0	0	0	0	0	0	1.69	0	0	0	0	0
0	0.42	0.08	0.21	1.33	0.04	0.8	0	3.71	0	0	0
0	0	0	0	0	0	0.14	0	0	0	0	0
1.48	0.29	0.03	0.28	2.77	0.04	1.58	15.1	5.79	0.02	0.01	0
0.28	0	0	0	0	0.21	0.12	7.52	0	0.01	0.02	0
0	0	0.07	0.64	4.96	0.04	37.3	0	4.48	0.02	0	0
5.82	0	0	0	0	0.21	0.08	74.3	0	0.02	0.11	0

Model Output: OFFROAD2021 (v1.0.5) Emissions Inventory
Region Type: Air Basin
Region: San Francisco Bay Area
Calendar Year: 2024
Scenario: All Adopted Rules - Exhaust
Vehicle Classification: OFFROAD2021 Equipment Types
Units: tons/day for Emissions, gallons/year for Fuel, hours/year for Activity, Horsepower-hours/year for Horsepower-hours

Region	Calendar Y	Vehicle Category	Model Yea	Horsepow	Fuel	HC_tpc	ROG_tp	TOG_tp	CO_tpc	NOx_tp	CO2_tp	PM10_	PM2.5_	SOx_tp	NH3_tp	Fuel Consumpti	Total_Acti	Total_Populatio	Horsepower_Hours_	Total Hours per Year
San Francisco Bay Area	2024	Pleasure Craft - Vessels W/Outboard Engines	Aggregat e	Aggregat e	Gasoline	5.484	5.539	6.035	22.42	0.913	107.7	0.554	0.419	0.002	0.002	6046444.292	0	43560.88622	0	2700774.946 62 source: PC2014

EF estimation (lb/hr)

Year	ROG	NOx	CO2	PM10	PM2.5
2024	1.497092	0.246807	29.12151	0.15	0.113

Average Emission (lb/day) during Construction Phase

Year	Total work	Work days	Hours per day	ROG	NOx	PM10	PM2.5	CO2
2024	120	15	1	0.187	0.031	0.019	0.014	3.64

CO2 Annual emission (tpy)

CO2
0.025

2205 lb/MT

Fuel Efficiency

Year	Gas - gallons per hour
2024	2.238781244

Notes: The Client's equipment is modeled as Offroad - Peasure Craft - Vessel with Offboard Engine, based on Figure 2-4 PREP EIR picture of Barge-based Vibracore Drill Set Up. The Offroad Equipment Database Statewide Emission dataset is used, along with an actvitiy of 62 hours per vessel assumed based on PC2014 Spark Ignition Marine Engine Database.

Helicopter Emissions

Helicopter operation	**Value**	Source
Kilograms of jet fuel used per hour	283.9	Table 9, FOCA 2015 - used KMAX K-1200 as proxy
Kilograms of fuel used per LTO	43.3	Table 9, FOCA 2015 - used KMAX K-1200 as proxy
Gallons of jet fuel used per hour	92.72468415	calculated
Gallons of jet fuel used per LTO	14.14222904	calculated
Average hours/use (assumes 1 LTO per hour)	4.266666667	Applicant data
Total Days Helicopter Used per Year	120	Applicant data
Total Hours Helicopter Used per Year	512	Applicant data
Total gallons used for cruising	47,475	calculated
Total gallons used for LTO	7,241	calculated
Total gallons used per year	54,716	calculated
Jet A Emissions Factor (kg CO2/gal)	9.75	Table 2.1, Climate Registry 2022 Emission Factors
Jet A Emissions Factor (g N2O/gal)	0.3	Table 2.7, Climate Registry 2022 Emission Factors
GWP N2O	298	IPCC Fourth Assessment Report: Climate Change 2007, 2.10.2 Direct Global Warming Potentials
Cruising MTCO2E	467.13	calculated
LTO MTCO2E	71.25	calculated
Total MTCO2E	538.37	calculated

Note: No emission factor available for CH4 helicopter emissions.

		nox		activity	g	lb
LTO	g/lto	389	4.3	1672.7	3.6876753	
Cruising	g/hr	3350	4.3	14405	31.757615	
					35.44529	

Helicopter Information	**Value**	**Source**
Aircraft Type	Helicopter	
Engine Type	T53 17A-1	FOCA 2015
Engine SHP	1500	FOCA 2015
Number of engines	1	FOCA 2015

https://www.t53.com/

The T5317A, A-1, and B engines are commercial variants of the military T53-L-703 engine. These commercial engines are rated at 1,500 shp (1119 kW)

The T5317 series powers a range of aircraft including the Bell 205A-1, Fuji-Bell 205, Kaman K-Max, and the Eagle 212 Single

Emissions Calculations

	HC	ROG (5)	NOX	PM10	PM2.5
LTO EF (g/LTO)*	207	262	389	11	11
Cruising EF (g/hour)*	510	646	3350	91	91
Emissions per day (lbs/day)	6.740	8.535	35.166	0.960	0.960
Annual Emissions (tons/year)	0.404	0.512	2.110	0.058	0.058

Note: Non volatile soot particle mass emission is used as a surrogate for PM10 and PM2.5 emission.
For PM emissions, these are very rough estimations and the error may be one order of magnitude. The suggested formulas are representing the current state of knowledge (FOCA 2015).

Note: emission rates based on the following data entry from Table 9, FOCA 2015 - Guidance on the Determination of Helicopter Emissions, Edition 2, Dec.

						LTO Emissions						One hour emissions					
Code	Aircraft_ICAO	Aircraft_Name	Engine_Name	Max SHP per engine	Number_of_Engines	LTO fuel (kg)	LTO NOx (g)	LTO HG (g)	LTO CO (g)	LTO PM non volatile (g)	LTO PM number	One hour fuel (kg)	One hour NOx (kg)	One hour HC (kg)	One hour CO (kg)	One hour PM non vol. (g)	One hour PM number
H303	KMAX	K-1200	T53 17A-1	1500	1	43.3	388.5	206.5	257.6	11	3.9765E+16	283.9	3.35	0.51	0.62	91	**1.66E+18**

NOx = Nitrogen oxides, HC = unburned hydrocarbons (unburned fuel), CO = Carbon monoxide, PM non volatile = Non volatile ultra fine particles, generally soot

Conversion:

2.20462	lb/kg	
1000	kg/metric ton	
453.592	g/lb	
907,185	g/short ton	
Jet A fuel specs: 6.75	lb/gallon	https://support.foreflight.com/hc/en-us/articles/6297854155159-What-fuel-density-does-Weight-Balance-use-

Terminology:
GWP = Global Warming Potential
MTCO2E = Metric tons of CO2 Equivalent
LTO = Landing and Takeoff
SHP = Shaft horsepower

Fugitive Dust Emissions

Emission factor used is equation for travel on paved roads shown on worksheet "Fugitive Dust Em. Rts."

Vehicle	Daily VMT	Paved Road (mi)	Unpaved Road (mi)	Paved Road		Unpaved Road		Total	
				PM10 (lbs/day)	PM2.5 (lbs/day)	PM10 (lbs/day)	PM2.5 (lbs/day)	PM10 (lbs/day)	PM2.5 (lbs/day)
Drill Rig Mobilization and Demobilization from Spokane Washington (950 miles)	1.02	0.98	0.04	0.006	0.001	0.001	0.000	0.01	0.00
Drill Rig Mobilization and Demobilization from Clark Fork, Idaho (1,050)	1.02	0.98	0.04	0.006	0.001	0.001	0.000	0.01	0.00
Drill Rig Mobilization and Demobilization from West Sacramento, California *135)	0.17	0.13	0.04	0.001	0.000	0.001	0.000	0.00	0.00
Water Truck (2000 gallon)	24	20	4	0.072	0.018	0.042	0.010	0.11	0.03
Helicopter Fuel Truck (F650)	39.68	39.68	0	0.133	0.033	0.000	0.000	0.13	0.03
Crew Transport Vehicles	900	900	0	0.315	0.079	0.000	0.000	0.32	0.08
ATV	12.5	1.25	11.25	0.000	0.000	0.016	0.004	0.02	0.00
Excavator	5		5	0.000	0.000	0.000	0.000	0.00	0.00

Assumptions:
Five miles on unpaved road per day for Excavator.
10% of ATV miles on paved road, 90% on unpaved road
Four miles out of 24 total miles per day occurs on unpaved road for water truck. Nearest hydrant for water truck refill is 5 miles from site (email correspondance with applicant), which results in 20 miles on paved road.
55% Reduction by BMP AQ1 watering unpaved road twice daily.

Summarized fugitive dust daily emissions (lb/day)

Equipment	PM10	PM2.5
Crew Transport Vehicles	0.02	0.00
Vendor Trucks	0.25	0.06
Haul Trucks	0.01	0.00
Construciton Equipment	0.02	0.00
Total	**0.29**	**0.07**

Figitive Dust Emission Factors

1 Aggregate Storage Piles [1] **(THIS EQUATION WAS NOT USED FOR ANY CALCULATIONS)**

Emissions result from several distinct processes within the stockpiling cycle: 1. loading in of materials through batch or drop operations, 2. equipment traffic in storage areas, 3. wind erosion of piles, 4. loadout of material through batch or drop operations

E(lb/ton)=(k)(0.0032)(U/5)^1.3/(M/2)^1.4

Where:	**PM10**	Unit	Source
k= Particle Size Multiplier:	0.35	lbs/ton	AP-42 Chapter 13.2.4-3, PM10 emissions
U=mean wind speed	6	mph	CalEEMod for Shasta County
M=moisture content (%)	0.034	constant	AP-42 Chapter 13.2.4-3, Table 13.2.4-1, exposed ground
	0.43	**lbs/ton**	

2 Travel on Unpaved Roads (Heavy Duty Trucks)[2]

E(lbs/VMT)=(k)(s/12)^a (W/3)^b

Where:	**PM10**	Unit	Source
k= Particle Size Multiplier:	1.5	lbs/VMT	AP-42 Chapter 13.2.2-2, PM10 emissions; industrial roads
s= Silt Content	0.043	constant	AP-42 Chapter 13.2.2-2, service roads
a=	0.9	constant	AP-42 Chapter 13.2.2-2, industrial roads
b=	0.45	constant	AP-42 Chapter 13.2.2-2, industrial roads
W=Vehicle Weight	2.1	tons	Worker Commute Vehicles
			Fuel Truck
	19.4	tons	
	20.9	tons	Water Truck
	34.55	tons	Heavy Duty Hauling Truck
	0.2575	tons	ATV
			Excavator
	45	tons	

Unpaved road fugitive dust emission factor:

PM10		
0.008	lbs/VMT	Worker Commute Vehicles
0.022	lbs/VMT	Fuel Truck
0.023	lbs/VMT	Water Truck
0.028	lbs/VMT	Heavy Duty Hauling Truck
0.003	lbs/VMT	ATV
0.032	lbs/VMT	Excavator

Vehicle Weight Estimation

Fuel Truck	Ford F650 (	metal tank (lb	fuel (lb)	
lbs	37000	750	2010	
unloaded	37750			
loaded	39760			
avg (tons)	19.3775			

Water Truc	MHDT	polyethylene	water (lb)	
lbs	33000	450	16680	
unloaded	33450			
loaded	50130			
avg (tons)	20.895			

Haul Truck	HHDT	drill rig
lbs	60000	18,200
unloaded	60000	
loaded	78200	
avg (tons)	34.55	

Conversion	
6.7	lb/gallon jet A fuel
300	gallon of fuel
8.34	lb/gallon water
2000	gallons of water

Component weight data source:
https://www.jmesales.com/jme-tanks-double-wall-ul142-skid-tanks-300-39-x-60-12/
https://www.tank-depot.com/norwesco-64-inch-wide-2000-gallon-plastic-vertical-water-storage-tank-in-black-n-41512
https://geoprobe.com/drilling-rigs/3100gt-geotechnical-drill-rig

2a Correction for Natural Precipitation[3]

E(ext)=E[(365-P)/365]

Where:		Unit	Source
P=#days/yr with>=0.01 precip	60	days	AP-42 Chapter 13.2.1, Figure 13.2.1-2
Corrected EF PM10	**0.007**	lbs/VMT	Worker Commute Vehicles
	0.018	lbs/VMT	Fuel Truck
	0.019	lbs/VMT	Water Truck
	0.024	lbs/VMT	Heavy Duty Hauling Truck
	0.003	lbs/VMT	ATV
	0.027	lbs/VMT	Excavator

3 Travel on Paved Roads

E(lbs/VMT)=(k)(sL)^.91 (W)^1.02

Where:	**PM10**	Unit	Source
k= Particle Size Multiplier:	0.0022	lbs/VMT	AP-42 Chapter 13.2.1, Table 13.2.1-1, PM10 emissions
sL= road surface silt loading	0.06	g/m^2	AP-42 Chapter 13.2.1, Table 13.2.1-2
W=Vehicle Weight	2.1	tons	Worker Commute Vehicles
	19.4	tons	Fuel Truck
	20.9	tons	Water Truck
	34.6	tons	Heavy Duty Hauling Truck
	0.3	tons	ATV

Paved road fugitive dust emission factor:		
PM10		
0.00037	lbs/VMT	Worker Commute Vehicles
0.00350	lbs/VMT	Fuel Truck
0.00378	lbs/VMT	Water Truck
0.00631	lbs/VMT	Heavy Duty Haul Trucks
0.00004	lbs/VMT	ATV

Correction for Natural Precipitation[5]

3a E(ext)=E[(1-P/4N)]

Where:		Unit	Source
Eext = annual or other long-term average emission fac		lbs/VMT	
P=#days/yr with >=0.01 inch precipitat	60	days	AP-42 Chapter 13.2.1, Figure 13.2.1-2
N=# days in averaging period	365	days	
Corrected EF PM10	**0.00035**	lbs/VMT	Worker Commute Vehicles
	0.00335	lbs/VMT	Fuel Truck
	0.00362	lbs/VMT	Water Truck
	0.00605	lbs/VMT	Heavy Duty Haul Trucks
	0.00004	lbs/VMT	ATV

Worker Commute Vehicle Weight Calculation

Parameters and Calculations for Worker Commute Trips (i.e., passenger vehicles)			Source
	LDA, LDT1, LDT2		default value in CalEEMod's tab for Trips and VMT in the Construction module
Vehicle class for worker trips	4230	lb	average of vehicle categoriy weight (LDA-3,190 lbs, LDT1-3,750 lbs, LDT2-5,750 lbs) from EMFAC2011
Weight	2000	lb/ton	google.com
Mass conversion	2.12	ton	calculation
Weight			

4 Bulldozing[6] **(THIS EQUATION WAS NOT USED FOR ANY CALCULATIONS)**

Equation is applied to graders and dozers to estimate fugitive dust from grading activity
Emissions factors for P10 from bulldozing are scaled from those of PM15

E(lbs/hr)=C(PM15)*s^1.5/M^1.5
Where
E(PM10)=E(PM15)*F(PM10)

			PM15 Unit	Source
Where:		1	constant	AP-42 Table 11.9-1, PM15,overburden
C=	coeffiecient	0.079	%	AP-42 Table 11.9-3,Overburden
M=	material moisture content	0.069	%	AP-42 Table 11.9-3,Overburden
s=	material silt content	0.75	constant	AP-42 Table 11.9-1, PM10
F=	scaling factor	0.63	lbs/hr	
		PM10		
		0.47	lbs/hr	

Sources

[1] EPA 2006.AP-42, Chapter 13.2.4 Miscellaneous Sources, Aggregate Storage Piles, Equation 1
[2] EPA. AP 42, Fifth Edition, Volume I, Chapter 13: Miscellaneous Sources, 13.2.2 Unpaved Roads, Eqn. 1
[3] EPA. AP 42, Fifth Edition, Volume I, Chapter 13: Miscellaneous Sources, 13.2.2 Unpaved Roads, Eqn. 2
[4] EPA. AP 42, Fifth Edition, Volume I, Chapter 13: Miscellaneous Sources, 13.2.1 Paved Road, Eqn. 1
[5] EPA. AP 42, Fifth Edition, Volume I, Chapter 13: Miscellaneous Sources, 13.2.1 Paved Road, Eqn. 2
[6] EPA 1998. AP-42 Chapter 11.9 Mineral Products Industry, Western Surface Coal Mining, Equation 11.9-1 Bulldozing

Equipment	Fuel	Horsepower	Load Factor
Aerial Lifts	Gasoline	33	0.46
Air Compressors	Gasoline	6	0.56
Bore/Drill Rigs	Gasoline	17	0.79
Cement and Mortar Mixers	Gasoline	7	0.59
Concrete/Industrial Saws	Gasoline	10	0.78
Cranes	Gasoline	74	0.47
Crushing/Proc. Equipment	Gasoline	12	0.85
Dumpers/Tenders	Gasoline	9	0.41
Forklifts	Gasoline	70	0.30
Generator Sets	Gasoline	11	0.68
Other Construction Equipment	Gasoline	126	0.48
Other General Industrial Equipment	Gasoline	11	0.54
Other Material Handling Equipment	Gasoline	54	0.53
Paving Equipment	Gasoline	8	0.59
Plate Compactors	Gasoline	6	0.55
Pressure Washers	Gasoline	7	0.85
Pumps	Gasoline	6	0.69
Rollers	Gasoline	12	0.62
Rough Terrain Forklifts	Gasoline	85	0.63
Rubber Tired Loaders	Gasoline	72	0.54
Signal Boards	Gasoline	8	0.76
Skid Steer Loaders	Gasoline	19	0.58
Surfacing Equipment	Gasoline	8	0.49
Sweepers/Scrubbers	Gasoline	13	0.71
Tractors/Loaders/Backhoes	Gasoline	63	0.48
Trenchers	Gasoline	15	0.66
Welders	Gasoline	16	0.51

CalEEMod 2022 Appendix G Table G-12

EMFAC202x Vehicle & Fuel	EMFAC202x Vehicle Class	Description	EMFAC2011 Vehicle Class	EMFAC2007 Vehicle Class
LDA-Dsl	LDA	Passenger Cars	LDA	LDA
LDA-Gas				
LDA-Elec				
LDA-Phe				
LDT1-Dsl	LDT1	Light-Duty Trucks (GVWR* <6000 lbs. and ETW** <= 3750 lbs.)	LDT1	LDT1
LDT1- Gas				
LDT1-Elec				
LDT1-Phe				
LDT2-Dsl	LDT2	Light-Duty Trucks (GVWR <6000 lbs. and ETW 3751-5750 lbs.)	LDT2	LDT2
LDT2-Gas				
LDT2-Elec				
LDT2-Phe				
MDV-Dsl	MDV	Medium-Duty Trucks (GVWR 5751-8500 lbs.)	MDV	MDV
MDV-Gas				
MDV-Elec				
MDV-Phe				
MH-Dsl	MH	Motor Homes	MH	MH
MH-Gas				
MCY-Gas	MCY	Motorcycles	MCY	MCY
LHD1 – Dsl	LHD1	Light-Heavy-Duty Trucks (GVWR 8501-10000 lbs.)	LHDT1	LHDT1
LHD1-Gas				
LHD1-Elec				
LHD2 – Dsl	LHD2	Light-Heavy-Duty Trucks (GVWR 10001-14000 lbs.)	LHDT2	LHDT2
LHD2-Gas				
LHD2-Elec				
T6 Public Class 4-Dsl	T6 Public Class 4		T6 Public	MHDT
T6 Public Class 4-Elec		Medium-Heavy Duty Public Fleet Truck (GVWR 14001-		
T6 Public Class 4-NG				
T6 Public Class 5-Dsl	T6 Public Class 5	Medium-Heavy Duty Public Fleet Truck (GVWR 16001-19500	T6 Public	MHDT
T6 Public Class 5-Elec				
T6 Public Class 5-NG				
T6 Public Class 6-Dsl	T6 Public Class 6	Medium-Heavy Duty Public Fleet Truck (GVWR 19501-	T6 Public	MHDT
T6 Public Class 6-Elec				
T6 Public Class 6-NG				
T6 Public Class 7-Dsl	T6 Public Class 7	Medium-Heavy Duty Public Fleet Truck (GVWR 26001-33000	T6 Public	MHDT
T6 Public Class 7-Elec				
T6 Public Class 7-NG				
T6 Utility Class 5-Dsl	T6 Utility Class 5	Medium-Heavy Duty Utility Fleet Truck (GVWR 16001-19500	T6 Utility	MHDT
T6 Utility Class 5-Elec				
T6 Utility Class 5-NG				
T6 Utility Class 6-Dsl	T6 Utility Class 6	Medium-Heavy Duty Utility Fleet Truck (GVWR 19501-26000	T6 Utility	MHDT
T6 Utility Class 6-Elec				
T6 Utility Class 6-NG				
T6 Utility Class 7-Dsl	T6 Utility Class 7	Medium-Heavy Duty Utility Fleet Truck (GVWR 26001-33000	T6 Utility	MHDT
T6 Utility Class 7-Elec				
T6 Utility Class 7-NG				
T6 Instate Tractor Class 6-Dsl	T6 Instate Tractor Class 6	Medium-Heavy Duty Tractor Truck (GVWR 19501-26000 lbs.)	T6 Instate small	MHDT
T6 Instate Tractor Class 6-Elec				
T6 Instate Tractor Class 6-NG				
T6 Instate Delivery Class 4-Dsl	T6 Instate Delivery Class 4		T6 Instate small	MHDT
T6 Instate Delivery Class 4-Elec				

Tablex. Mapping EMFAC 202x to CalEEmod by Gross Vehicle Weights

EMFAC202x Vehicle Class	CalEEMod	ETW (lb)
LDA, MCY	LDA	All
LDT1	LDT1	<= 3,750
LDT2	LDT2	3,751 – 5,750
MDV, MH, LHD, T6,	MHDT	14,001 – 33,000
T7, PTO, BUS, Motor Coach	HHDT	33,000 – 60,000

ETW: Empty truck weight
GVWR: Gross Vehicle Weight Rating, max weight of loaded vehicle including its own weight

Here is a general guideline of the approximate weight range for each class of motorhome:

Class A Motorhomes:

Average Weight Range: 13,000 to 30,000 pounds (5,900 to 13,600 kilograms)
Larger Class A motorhomes can exceed 30,000 pounds.

Class B Motorhomes (Camper Vans):

Average Weight Range: 6,000 to 10,000 pounds (2,700 to 4,500 kilograms)
Class B motorhomes are typically lighter due to their compact size.

Class C Motorhomes:

Average Weight Range: 10,000 to 15,000 pounds (4,500 to 6,800 kilograms)
Class C motorhomes are generally lighter than Class A but heavier than Class B.

T6 Instate Delivery Class 4-NG		Medium-Heavy Duty Delivery Truck (GVWR 14001-16000 lbs.)		
T6 Instate Delivery Class 5-Dsl	T6 Instate Delivery Class 5	Medium-Heavy Duty Delivery Truck (GVWR 16001-19500 lbs.)	T6 Instate small	MHDT
T6 Instate Delivery Class 5-Elec				
T6 Instate Delivery Class 5-NG				
T6 Instate Delivery Class 6-Dsl	T6 Instate Delivery Class 6	Medium-Heavy Duty Delivery Truck (GVWR 19501-26000 lbs.)	T6 Instate small	MHDT
T6 Instate Delivery Class 6-Elec				
T6 Instate Delivery Class 6-NG				
T6 Instate Other Class 4-Dsl	T6 Instate Other Class 4	Medium-Heavy Duty Other Truck (GVWR 14001-16000 lbs.)	T6 Instate small	MHDT
T6 Instate Other Class 4-Elec				
T6 Instate Other Class 4-NG				
T6 Instate Other Class 5 -Dsl	T6 Instate Other Class 5	Medium-Heavy Duty Other Truck (GVWR 16001-19500 lbs.)	T6 Instate small	MHDT
T6 Instate Other Class 5-Elec				
T6 Instate Other Class 5-NG				
T6 Instate Other Class 6 – Dsl	T6 Instate Other Class 6	Medium-Heavy Duty Other Truck (GVWR 19501-26000 lbs.)	T6 Instate small	MHDT
T6 Instate Other Class 6-Elec				
T6 Instate Other Class 6-NG				
T6 Instate Tractor Class 7-Dsl	T6 Instate Tractor Class 7	Medium-Heavy Duty Tractor Truck (GVWR 26001-33000 lbs.)	T6 Instate heavy	MHDT
T6 Instate Tractor Class 7 –Elec				
T6 Instate Tractor Class 7-NG				
T6 Instate Delivery Class 7 -Dsl	T6 Instate Delivery Class 7	Medium-Heavy Duty Delivery Truck (GVWR 26001-33000 lbs.)	T6 Instate heavy	MHDT
T6 Instate Delivery Class 7 -Elec				
T6 Instate Delivery Class 7 -NG				
T6 Instate Other Class 7-Dsl	T6 Instate Other Class 7	Medium-Heavy Duty Other Truck (GVWR 26001-33000 lbs.)	T6 Instate heavy	MHDT
T6 Instate Other Class 7-Elec				
T6 Instate Other Class 7-NG				
T6 CAIRP Class 4-Dsl	T6 CAIRP Class 4		T6 CAIRP small	MHDT
T6 CAIRP Class 4-Elec		Medium-Heavy Duty CA International Registration Plan Truck (GVWR 14001-16000 lbs.)		
T6 CAIRP Class 5-Dsl	T6 CAIRP Class 5	Medium-Heavy Duty CA International Registration Plan	T6 CAIRP small	MHDT
T6 CAIRP Class 5-Elec				
T6 CAIRP Class 6-Dsl	T6 CAIRP Class 6	Medium-Heavy Duty CA International Registration Plan	T6 CAIRP small	MHDT
T6 CAIRP Class 6-Elec				
T6 CAIRP Class 7- Dsl	T6 CAIRP Class 7	Medium-Heavy Duty CA International Registration Plan Truck (GVWR 26001-	T6 CAIRP heavy	MHDT
T6 CAIRP Class 7-Elec				
T6 CAIRP Class 7-NG				
T6 OOS Class 4-Dsl	T6 OOS Class 4	Medium-Heavy Duty Out-of-state Truck (GVWR 14001-16000 lbs.)	T6 OOS small	MHDT
T6 OOS Class 5-Dsl	T6 OOS Class 5	Medium-Heavy Duty Out-of-state Truck (GVWR 16001-19500 lbs.)		MHDT
T6 OOS Class 6-Dsl	T6 OOS Class 6	Medium-Heavy Duty Out-of-state Truck (GVWR 19501-26000 lbs.)		MHDT
T6 OOS Class 7-Dsl	T6 OOS Class 7	Medium-Heavy Duty Out-of-state Truck (GVWR 26001-33000 lbs.)	T6 OOS heavy	MHDT
T6TS-Gas	T6TS	Medium-Heavy Duty Truck	T6TS	MHDT
T6TS-Elec				
T7 Public Class 8-Dsl	T7 Public Class 8	Heavy-Heavy Duty Public Fleet Truck (GVWR 33001 lbs. and over)	T7 Public	HHDT
T7 Public Class 8-Elec				
T7 Public Class 8-NG				
T7 CAIRP Class 8-Dsl	T7 CAIRP Class 8	Heavy-Heavy Duty CA International Registration Plan Truck (GVWR 33001 lbs. and over)	T7 CAIRP	HHDT
T7 CAIRP Class 8-Elec				
T7 CAIRP Class 8-NG				
T7 Utility Class 8-Dsl	T7 Utility Class 8	Heavy-Heavy Duty Utility Fleet Truck (GVWR 33001 lbs. and	T7 Utility	HHDT
T7 Utility Class 8-Elec				
T7 NNOOS Class 8-Dsl	T7 NNOOS Class 8	Heavy-Heavy Duty Non-Neighboring Out-of-state Truck (GVWR 33001 lbs. and over)	T7 NNOOS	HHDT
T7 NOOS Class 8-Dsl	T7 NOOS Class 8	Heavy-Heavy Duty Neighboring Out-of- state Truck (GVWR 33001 lbs. and over)	T7 NOOS	HHDT

T7 Other Port Class 8-Dsl	T7 Other Port Class 8	Heavy-Heavy Duty Drayage Truck at Other Facilities	T7 Other Port	HHDT
T7 Other Port Class 8-Elec				
T7 POAK Class 8-Dsl	T7 POAK Class 8	Heavy-Heavy Duty Drayage Truck in Bay Area (GVWR 33001	T7 POAK	HHDT
T7 POAK Class 8-Elec				
T7 POAK Class 8-NG				
T7 POLA Class 8-Dsl	T7 POLA Class 8	Heavy-Heavy Duty Drayage Truck near	T7 POLA	HHDT
T7 POLA Class 8-Elec				
T7 POLA Class 8-NG		South Coast (GVWR 33001 lbs. and over)		
T7 Single Concrete/Transit Mix Class 8-Dsl	T7 Single Concrete/Transit Mix Class 8	Heavy-Heavy Duty Single Unit Concrete/Transit Mix Truck (GVWR 33001 lbs and over)	T7 Single	HHDT
T7 Single Concrete/Transit Mix Class 8-Elec				
T7 Single Concrete/Transit Mix Class 8-NG				
T7 Single Dump Class 8-Dsl	T7 Single Dump Class 8	Heavy-Heavy Duty Single Unit Dump Truck (GVWR 33001 lbs. and over)	T7 Single	HHDT
T7 Single Dump Class 8-Elec				
T7 Single Dump Class 8-NG				
T7 Single Other Class 8-Dsl	T7 Single Other Class 8	Heavy-Heavy Duty Single Unit Other Truck (GVWR 33001 lbs. and over)	T7 Single	HHDT
T7 Single Other Class 8-Elec				
T7 Single Other Class 8-NG				
T7 Tractor Class 8-Dsl	T7 Tractor Class 8	Heavy-Heavy Duty Tractor Truck (GVWR 33001 lbs. and over)	T7 Tractor	HHDT
T7 Tractor Class 8-Elec				
T7 Tractor Class 8-NG				
T7 SWCV Class 8-Dsl	T7 SWCV Class 8	Heavy-Heavy Duty Solid Waste Collection Truck (GVWR 33001	T7 SWCV	HHDT
T7 SWCV Class 8-Elec				
T7 SWCV Class 8-NG				
T7IS-Gas	T7IS	Heavy-Heavy Duty Truck	T7IS	HHDT
T7IS-Elec				
PTO-Dsl	PTO	Power Take Off	PTO	HHDT
PTO-Elec				
SBUS-Gas	SBUS	School Buses	SBUS	SBUS
SBUS-Dsl				
SBUS-Elec				
SBUS-NG				
UBUS-Dsl	UBUS	Urban Buses	UBUS	UBUS
UBUS-Gas				
UBUS-Elec				
UBUS-NG				
Motor Coach-Dsl	Motor Coach	Motor Coach	Motor Coach	OBUS
Motor Coach-Elec				
OBUS-Gas	OBUS	Other Buses	OBUS	OBUS
OBUS-Elec				
All Other Buses-NG	All Other Buses	All Other Buses	All Other Buses	OBUS
All Other Buses-Dsl				

Appendix **D**:
Biological Resources

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

Public Draft Initial Study/Mitigated Negative Declaration

List of Biological Resources Attachments

This appendix consists of a series of attachments for the assessment of biological resources as described in Section 4.4 Biological Resources and as presented below.

Attachment 1 - Biological Resources Assessment Report
Provides a summary of the results of the botanical and wildlife special-status species surveys, which included focused site assessments for California red-legged frog (*Rana draytonii*) (CRLF) and California tiger salamander (*Ambystoma californiense*), conducted in 2019 and 2020 in support of Valley Water's Pacheco Reservoir Expansion Project (PREP).

Attachment 2 - Terrestrial Habitat Mapping
Describes the terrestrial habitat types present in the upstream and downstream area. Habitat types have been classified into fine-scale vegetation communities per the Manual of California Vegetation, and other land cover types (e.g., urban, agriculture, water).

Attachment 3 - Aquatic Resources Delineation
Describes potential waters of the U.S and waters of the state present within the upstream and downstream areas.

Attachment 4 – 2023 Eagle Survey Results Technical Memorandum
Describes the results of the 2023 eagle surveys conducted to support 2023 geotechnical investigations.

Appendix D: Biological Resources

Pacheco Reservoir Expansion Project Design Level Geotechnical Investigations

Attachment 1 - Biological Resources Assessment Report

Provides a summary of the results of the botanical and wildlife special-status species surveys, which included focused site assessments for California red-legged frog (*Rana draytonii*) (CRLF) and California tiger salamander (*Ambystoma californiense*), conducted in 2019 and 2020 in support of Valley Water's Pacheco Reservoir Expansion Project (PREP).

- Exhibit 1A – USFWS, CNDDB, and CNPS Database Results
- Exhibit 1B – Botanical Special-Status Species Assessment
    - Sub-exhibit 1B1 – Plant Species Observed
    - Sub-exhibit 1B2 – Special-status Plant Species Observed Representative Photographs
- Exhibit 1C – California Red-legged Frog Site Assessment
    - Sub-exhibit 1C1 – CRLF Habitat Site Assessment Data Sheets
    - Sub-exhibit 1C2 – Site Assessment Results and Survey Locations
- Exhibit 1D – California Tiger Salamander Site Assessment
    - Sub-exhibit 1D1 – Representative Aquatic and Terrestrial Habitat Photographs
    - Sub-exhibit 1D2 – List of all Aquatic Features, Location, Habitat Type, Size and Suitability
- Exhibit 1E – Other Special-Status Wildlife Species Habitat Assessment



Attachment 1 – Biological Resources Assessment Report

Geotechnical Investigations in Support of the Pacheco Reservoir Expansion Project

June 2024

Prepared by:

AECOM

Stantec GEI Consultants

Prepared for:

Valley Water

Valley Water Project Number: 91954002

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Exhibit 1B – Botanical Special-Status Species Assessment
Exhibit 1C – California Red-legged Frog Site Assessment
Exhibit 1D – California Tiger Salamander Site Assessment
Exhibit 1E – Other Special-Status Wildlife Species Habitat Assessment

Acronyms and Abbreviations

AF	acre-feet
CDFW	California Department of Wildlife
CESA	California Endangered Species Act
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CRLF	California red-legged frog
CRPR	California Rare Plant Rank
CTS	California tiger salamander
CVP	Central Valley Project
CWA	Clean Water Act
ESA	federal Endangered Species Act
GPS	global positioning system
PPWD	Pacheco Pass Water District
PREP	Pacheco Reservoir Expansion Project
Project	Design Level Geotechnical Investigations
SBCWD	San Benito County Water District
SCVHP	Santa Clara Valley Habitat Plan/
SR-152	State Route 152
SWP	State Water Project
Valley Habitat Plan	Santa Clara Valley Habitat Plan
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

Chapter 1. Introduction

This Biological Resources Assessment Report was prepared for the proposed 2024 geotechnical investigations (Project) in order to further support the design and analysis of Valley Water's proposed Pacheco Reservoir Expansion Project (PREP[1]). This report has been prepared to provide a summary of the results of the botanical and wildlife special-status species surveys (i.e., provides biological setting information and does not disclose/discuss impacts on special-status species), which included focused site assessments for California red-legged frog (*Rana draytonii*) (CRLF) and California tiger salamander (*Ambystoma californiense*) (CTS), as well as focused botanical surveys during appropriate bloom periods, conducted in 2020, 2022, and 2023 for the larger PREP planning process. The results of the surveys and site assessments are also intended to be used to develop the mitigation framework necessary to support PREP planning process. Information is provided in separate attachments for the terrestrial habitat mapping, aquatic resources delineations, and other special-status wildlife species habitat assessment.

PREP is a multi-agency effort to provide water supply reliability, environmental restoration, and other benefits through the construction of new facilities and long-term operation strategies. It would include expanding the storage capacity of the existing Pacheco Reservoir to up to approximately 140,000 acre-feet (AF) through construction of a new dam, conveyance facilities, and appurtenant infrastructure.

1.1 Background

The existing Pacheco Reservoir and North Fork Dam were constructed in 1939 by the Pacheco Pass Water District (PPWD) to provide irrigation and domestic water supply. These facilities are owned and operated by the PPWD. The existing reservoir has an operational capacity of 5,500 AF. Water released from the reservoir flows down Pacheco Creek and recharges the underlying groundwater aquifer. Agricultural water users in PPWD and San Benito County Water District (SBCWD) pump water from the aquifer.

PREP includes construction and operation of a new dam and reservoir, pump station, conveyance facilities, and related miscellaneous infrastructure (e.g., access roads). The new dam and reservoir would be constructed on Pacheco Creek upstream from the existing North Fork Dam and would inundate most of the existing Pacheco Reservoir.

1.2 Project Location

The proposed Project is in an area of unincorporated Santa Clara County, approximately 17 miles northeast of the City of Gilroy and extends from State Route 152 (SR-152) north to several miles to the general area surrounding Pacheco Reservoir as shown in Figure 1-1. The headwaters of Pacheco Creek are in the Diablo Range, northeast of the city of Hollister. Downstream of Pacheco Reservoir, Pacheco Creek continues to flow west until it reaches San Felipe Lake, draining approximately 168 square miles in Santa Clara and San Benito counties.

[1] PREP is a multi-agency effort to provide water supply reliability, environmental restoration, and other benefits through the construction of new facilities and long-term operation strategies. It would include expanding the storage capacity of the existing Pacheco Reservoir to up to approximately 140,000 acre-feet (AF) through construction of a new dam, conveyance facilities, and appurtenant infrastructure.

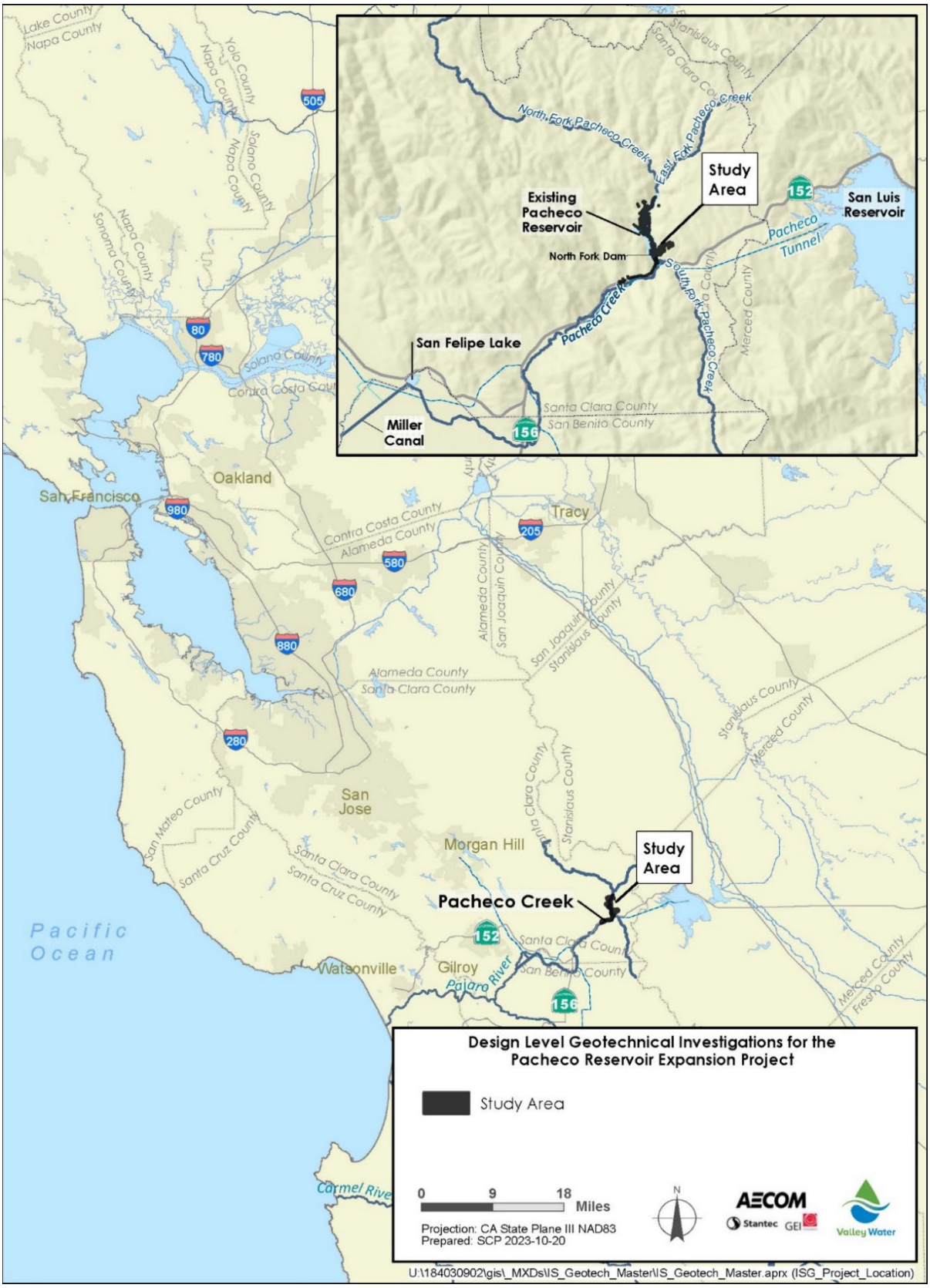

Figure 1-1. Project Location

San Felipe Lake is drained by Miller Canal, which joins the Pajaro River and flows southwest until it drains into Monterey Bay.

San Luis Reservoir is located eight miles east of existing Pacheco Reservoir in unincorporated Merced County. The U.S. Department of the Interior, Bureau of Reclamation owns and jointly operates San Luis Reservoir with the California Department of Water Resources to provide seasonal storage for the CVP and the State Water Project. Deliveries from San Luis Reservoir to CVP San Felipe Division of the CVP (i.e., deliveries to Valley Water and SBCWD) flow west through the Pacheco Pumping Plant and Conduit.

Chapter 2. Methods

The Project study area is centered around Pacheco Reservoir and includes areas adjacent to Pacheco Creek, North Fork Pacheco Creek and South Fork Pacheco Creek where geotechnical investigations are proposed within the Project study area (Figure 2-1). In total, the Project study area encompasses approximately 55 acres and includes the currently proposed impact areas associated with geotechnical borings, test pits, staging areas, and access routes.

Numerous surveys were conducted within the Project study area between 2020 and 2023 in support pf the larger PREP planning and design processes. Most of these efforts were focused on identification of rare, threatened, and endangered species and on mapping the extent of habitats and aquatic resources. Table 2-1 outlines surveys and assessments that have been performed in the Project study area, type of survey/assessment conducted and the time frame that they were conducted. A summary of results for each survey/assessment is described in Chapter 3. In addition to the surveys/assessments listed in Table 2-1, separate attachments have been prepared for terrestrial habitat mapping, aquatic resources delineation, and other special-status wildlife species habitat assessments. The information documented in these attachments was used to inform the determination of potential for special-status species and their habitat to occur in the study area.

Table 2-1. Field Surveys/Assessments Conducted and Date

Species or Habitat Assessment	Survey Type	Date
Special-Status Botanical Species	Focused special-status plant botanical surveys and non-native invasive plant mapping.	March 16 to April 6, 2020; May 4 to May 22, 2020; July 20 to August 14, 2020; May 9 and 15, June 5 and 21, July 31, and August 4 and 7, 2023.
Special-Status Amphibian Species	Protocol habitat assessment and reconnaissance surveys.	March 10, 11, 12, 30, April 1 and 2, and May 7 and 8, 2020; September 21, 2022; March 30 and 31, 2023.
Special-Status Reptile Species	Habitat assessment surveys.	March 10, 11, 12, 30, April 1 and 2, and May 7 and 8, 2020; September 21, 2022; March 30 and 31, 2023.
Special-Status Mammalian Species	Habitat assessment surveys.	March 10, 11, 12, 30, April 1 and 2, and May 7 and 8, 2020; September 21, 2022; March 30 and 31, 2023.
Special-Status Insect Species	Habitat assessment surveys.	March 16 to April 6, 2020; May 4 to May 22, 2020; and July 20 to August 14, 2020; September 21, 2022; March 30 and 31, 2023.

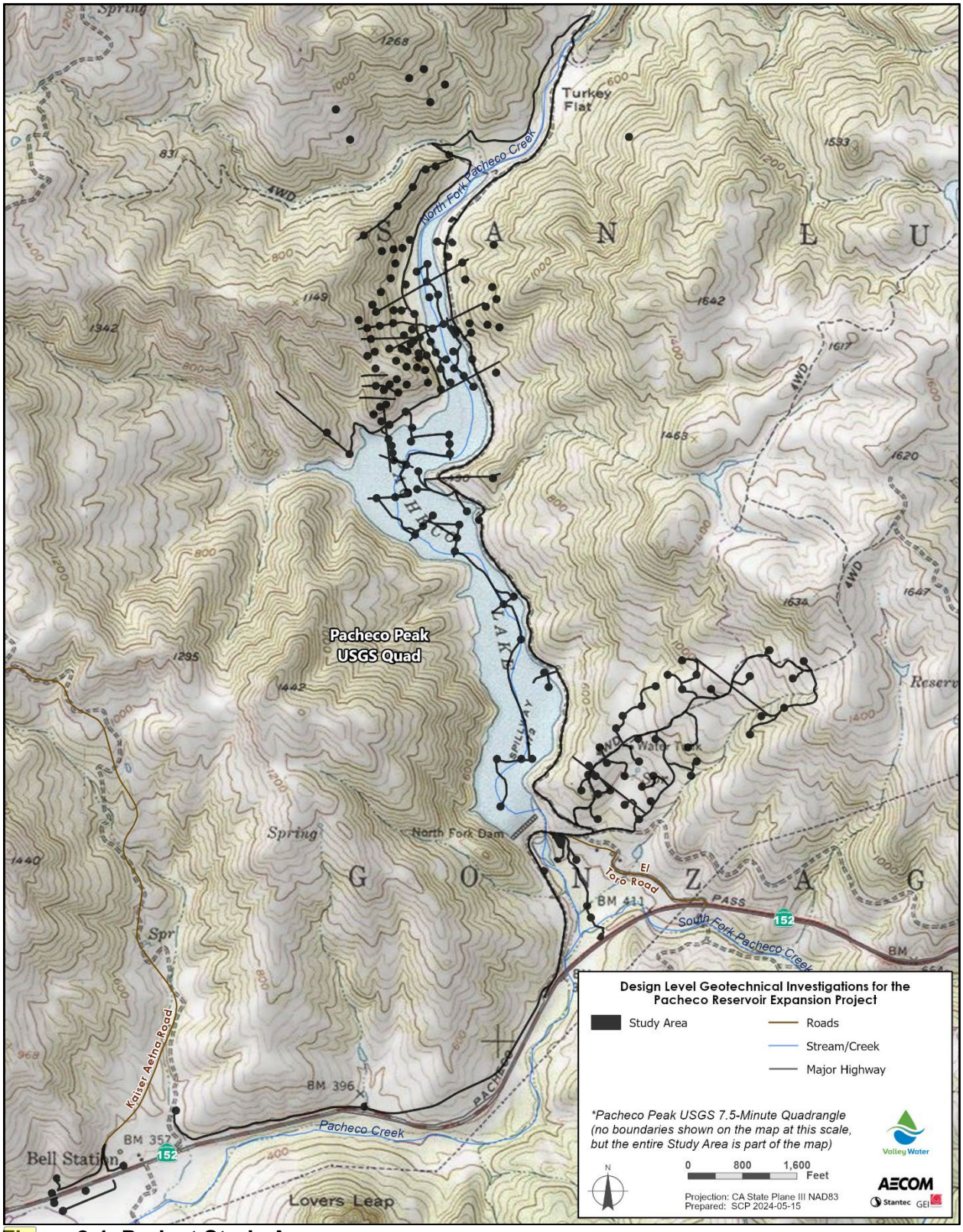

Figure 2-1. Project Study Area

2.1 Special-Status Species Desktop and Literature Review

Special-status plant and wildlife species that may occur in the Project study area were determined, in part, by reviewing natural resource agency databases, literature, and other relevant sources. The following information sources were reviewed:

- *Pacheco Peak, California* U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle;
- Aerial photographs of the Project study area and vicinity;
- U.S. Fish and Wildlife Service (USFWS) list of endangered and threatened species that may occur in the vicinity of the Project study area (USFWS 2023a) (Exhibit 1A);
- USFWS Critical Habitat Mapper (USFWS 2023b);
- CDFW California Natural Diversity Database (CNDDB) plant and wildlife records (CNDDB 2023a) (Exhibit 1A) and the California Native Plant Society Online Inventory of Rare and Endangered Plants (CNPS) (CNPS 2023) records for the *Pacheco Peak, California* USGS 7.5-minute topographic quadrangle and the surrounding quadrangles immediately adjacent (i.e., reviewed 8 quadrangles total) (Exhibit 1A);
- California Wildlife Habitat Relationships System (CDFW 2014);
- Species and land cover descriptions identified in the Santa Clara Valley Habitat Plan (Santa Clara County 2012); and
- Information from *The Jepson Manual: Vascular Plants of California* (Baldwin et. Al. 2012) including applicable errata and supplements (Jepson Flora Project 2023).

A list of special-status species that could occur or are known to occur in the Project study area and vicinity was developed based on the literature and database review. The list was further refined based on desktop evaluations and field surveys to identify if potential habitat for those species exists in the Project study area (Tables 2-2 and 2-3).

2.2 Special-Status Species

Regionally occurring special-status species were identified based on a review of pertinent literature, the USFWS species list, CNDDB and CNPS database records, and current field survey efforts. The status of each special-status species was verified using the following:

- State and Federally Listed Endangered, Threatened and Rare Plants of California (CDFW 2023b)
- Special Vascular Plants, Bryophytes, and Lichens List (CDFW 2023c).
- Special Animals List (CDFW 2023d)
- State and Federally Listed Endangered and Threatened Animals of California (CDFW 2023e).

For each species, habitat requirements were assessed and compared to the habitats in the Project study area to determine if potential habitat for the species is present. For the purpose of this evaluation, special-status plant species include plants that are (1) listed as threatened or endangered under the California Endangered Species Act (CESA) or the federal Endangered

Species Act (ESA), (2) proposed for federal listing as threatened or endangered, (3) state or federal candidate species, (4) designated as rare by the CDFW, and (5) California Rare Plant Rank (CRPR) 1A, 1B, 2A, 2B, 3 or 4 species. Special-status wildlife species include species that are (1) listed as threatened or endangered under the CESA or ESA, (2) proposed for federal listing as threatened or endangered, (3) state or federal candidate species, (4) identified by the CDFW as species of special concern or fully protected species; (5) have been identified by resource agencies as having the potential to be proposed for listing in the immediate future; or (6) have been identified by local agencies as having regional and/or cultural significance.

Based on the desktop and pertinent literature review, 31 special-status plant species and 41 special-status wildlife species were analyzed for their potential to occur within the Project study area. Out of the 31 special-status plant species, 25 species were determined to have potential to occur based on the vegetation communities identified in the study area (Table 2-2). Out of the 41 special-status wildlife species, 37 species were determined to have potential to occur based on the vegetation communities/habitat present in the Project study area (Table 2-3). Exhibit 1B through Exhibit 1E provides further details on the special-status species that have potential to occur in the Project study area, including the results/finding of the focused botanical surveys. Potential for each of the special-status species to occur in Table 2-2 and Table 2-3 is based on the following criteria:

- **Present:** The species is known to be present or has been recently observed in the Project study area.
- **High:** The species has been observed and documented within 5 miles of the Project study area within the last 5 years and habitat for the species is present in the study area.
- **Moderate:** The study area is located within the range of the species, there are documented occurrences within 5 miles of the Project study area, and/or potential habitat for the species exists in the study area.
- **Low:** The Project study area is located within the range of the species, but no past documented occurrences have been recorded within 5 miles and/or only low quality (e.g., small, fragmented patches or habitats under the influence of frequent anthropogenic disturbances) are present in the study area.
- **Absent:** Focused surveys determined the species is absent from the Project study area, the species is acknowledged to be extirpated locally or the study area is located outside of the species range, or potential habitat to support the species is not present in the study area.

Table 2-2. Special-Status Plant Species with Potential to Occur in the Project Study Area

Common Name Scientific Name	Listing Status1	Habitat	Elevation	Bloom	Potential to Occur in Project Study Area
Santa Clara thorn-mint (*Acanthomintha lanceolata*)	–/–/4.2	Chaparral, cismontane woodland, coastal scrub, talus, rocky slopes, outcrops. Often in serpentinite.	260–3935 feet.	Mar–Jun.	**High[1].** The Project study area is within the known range of this plant species. There is potential suitable habitat for this plant species within the Project study area in the form of chaparral and cismontane woodland. There are no CNDDB occurrences of this plant species within 5 miles of the Project study area. However, there are two modern collections of this plant species within 5 miles of the Project study area. This species has also been identified both north and south of Pacheco Pass during previous efforts for the larger Pacheco Reservoir Expansion Project. On a scale of 1.0 to 6.5, this plant species has a mean ultramafic affinity of 3.4: a strong indicator. It is included within a group of 123 taxa with 65 to 74 percent (%) of their occurrences on ultramafics (such as serpentine). Serpentine soils and serpentine specific vegetation communities are not present in the study area.
Howell's onion (*Allium howellii* var. *howellii*)	–/–/4.3	Valley and foothill grassland (often clay or serpentinite).	160–7,220 feet.	Mar–Apr.	**Absent.** The Project study area is outside of the known range of this plant species. There is no potential suitable habitat for this plant species within the Project study area. There are no CNDDB records of this plant species within 5 miles of the Project study area.
Parry's rough tarplant (*Centromadia parryi* ssp. *rudis*)	–/–/4.2	Valley and foothill grassland (vernally mesic, alkaline), vernal pools, sometimes disturbed sites, roadsides	0–1,650 feet.	May–October (November).	**High[1].** Potential habitat for this plant species is present in the northern portion of the Project study area on the west side of the North Fork Pacheco Creek. This species has been identified both north and south of Pacheco Pass during previous efforts for the larger Pacheco Reservoir Expansion Project. There are no CNDDB occurrences of this plant species within 5 miles of the Project study area.

Common Name Scientific Name	Listing Status1	Habitat	Elevation	Bloom	Potential to Occur in Project Study Area
Brewer's clarkia (*Clarkia breweri*)	–/–/4.2	Chaparral, cismontane woodland, coastal scrub. Often in serpentine soils.	705–3,660 feet.	Apr–Jun.	**Moderate[1].** The Project study area is within the known range of this plant species and there is potential suitable habitat within the Project study area. There are no CNDDB occurrences of this plant species within 5 miles of the Project study area. On a scale of 1.0 to 6.5, this plant species has a mean ultramafic affinity of 3.8: a broad endemic/strong indicator. It is included within a group of 71 taxa with 75-84% of their occurrences on ultramafics (such as serpentine). Serpentine soils and serpentine specific vegetation communities are not present in the Project study area.
Santa Clara red ribbons (*Clarkia concinna* ssp. *automixa*)	–/–/4.2	Chaparral, cismontane woodland.	295–4,920 feet.	Apr–Jun.	**Moderate.** The Project study area is within the known range of this plant species. There is potential suitable habitat for this plant species within the Project study area in the form of chaparral and cismontane woodland. Species has been observed at Palassou Ridge (approximately 15 miles west of the Project study area) in 2004 by Valley Water botanists. There are no CNDDB occurrences of this plant species within 5 miles of the Project study area.
Lewis' clarkia (*Clarkia lewisii*)	–/–/4.3	Broadleafed upland forest, closed-cone coniferous forest, chaparral, cismontane woodland, coastal scrub.	95–3,920 feet.	May–Apr.	**Moderate.** The Project study area is within the northernmost extent of the range of this plant species. There is potential suitable habitat for this plant species within the Project study area in the form of cismontane woodland and chaparral. There are no CNDDB occurrences of this plant species within 5 miles of the Project study area.
Small-flowered morning-glory (*Convolvulus simulans*)	–/–/4.2	Openings in chaparral, coastal scrub, valley, and foothill grassland; clay, serpentinite seeps.	95–2,430 feet.	Mar–Jul.	**Low.** The Project study area is outside the known range of this plant species, but there is potential suitable habitat within the Project study area. There are no CNDDB occurrences of this plant species within 5 miles of the Project study area. On a scale of 1.0 to 6.5, this plant species has a mean ultramafic affinity of 3.7: a transition from a broad endemic to a strong indicator. It is included within a group of 71 taxa with 75 to 84% of their occurrences on ultramafics (such as serpentine). Serpentine soils and serpentine specific vegetation communities are not present in the Project study area.

Common Name Scientific Name	Listing Status1	Habitat	Elevation	Bloom	Potential to Occur in Project Study Area
Rattan's cryptantha (*Cryptantha rattanii*)	–/–/4.3	Cismontane woodland, riparian woodland, valley, and foothill grassland.	500–3,000 feet.	Apr–Jul.	**Low.** The Project study area is outside the known range of this plant species, but there is potential suitable habitat within the Project study area. There are no CNDDB occurrences of this plant species within 5 miles of the Project study area.
Hospital Canyon larkspur (*Delphinium californicum* ssp. *interius*)	–/–/1B.2	Openings in chaparral, cismontane woodland (mesic), coastal scrub.	635–3,595 feet.	Apr–Jun.	**High[1].** The Project study area is outside the known range of this plant species. There is potential suitable habitat for this plant species within the Project study area in the form of chaparral and cismontane woodland. This species has been identified both north and south of Pacheco Pass during previous efforts for the larger Pacheco Reservoir Expansion Project. There is one CNDDB occurrence of this plant species within 5 miles of the Project study area.
Santa Clara Valley dudleya (*Dudleya abramsii* ssp. *setchellii*)	E/–/1B.1	Rocky outcrops within cismontane woodland, valley, and foothill grassland, predominantly in serpentinite.	195–1,495 feet.	Apr–Oct.	**Moderate.** The Project study area is within the known range of this plant species. There is potential suitable habitat within the Project study area in the form of rocky outcrops within valley and foothill grassland and cismontane woodland. There is one CNDDB occurrences of this plant species within 5 miles of the Project study area. On a scale of 1.0 to 6.5, this plant species has a mean ultramafic affinity of 6.1: a strict endemic. It is included within a group of 164 taxa with 95% of their occurrences on ultramafics (such as serpentine). Serpentine soils and serpentine specific vegetation communities are not present in the Project study area.
Hoover's button-celery (*Eryngium aristulatum* var. *hooveri*)	–/–/1B.1	Vernal pools, seasonal wetlands, occasionally alkaline.	0–150 feet.	Jun–Jul.	**Low[1]**. The Project study area is outside of the known range of this plant species. Suitable habitat is present for the species in the Project study area. Species was previously detected within the vicinity of San Felipe Lake during previous efforts for the Pacheco Reservoir Expansion Project. There are no CNDDB occurrences of this plant species within 5 miles of the Project study area.

Common Name Scientific Name	Listing Status1	Habitat	Elevation	Bloom	Potential to Occur in Project Study Area
Spiny-sepaled button-celery (*Eryngium spinosepalum*)	–/–/1B.2	Valley and foothill grassland, vernal pools.	260–3,200 feet.	Apr–Jun.	**High**[1]. The Project study area is outside of the known range of this plant species. Suitable habitat is present for the species in the Project study area. This species has been identified just south of Pacheco Pass during previous efforts for the larger Pacheco Reservoir Expansion Project. There are no CNDDB occurrences of this plant species within 5 miles of the Project study area.
San Joaquin spearscale (*Extriplex joaquinana*)	–/–/1B.2	Chenopod scrub, meadows and seeps, playas, valley, and foothill grassland; alkaline habitats.	0–2,740 feet.	Apr–Oct.	**Low**[1]. The Project study area is outside of the known range of this plant species. Suitable habitat is present for the species in the Project study area. Species was previously detected within the vicinity of San Felipe Lake during previous efforts for the larger Pacheco Reservoir Expansion Project. There are no CNDDB occurrences of this plant species within 5 miles of the Project study area.
Stinkbells (*Fritillaria agrestis*)	–/–/4.2	Chaparral, cismontane woodland, pinyon and juniper woodland, valley, and foothill grassland; clay substrates, sometimes serpentinite.	30–5,100 feet.	Mar–Jun.	**Moderate**[1]. The Project study area is within the known range of this plant species. There is potential suitable habitat for this plant species within the Project study area in the form of chaparral, cismontane woodland, and valley and foothill grassland. There are no CNDDB occurrences of this plant species within 5 miles of the Project study area. Species has been observed in the eastern portion of the Pacheco Reservoir Expansion Project study area east of the Project study area. On a scale of 1.0 to 6.5, this plant species has a mean ultramafic affinity of 2.7: a strong indicator. It is included within a group of 123 taxa with 65 to 74% of their occurrences on ultramafics (such as serpentine). Serpentine soils and serpentine specific vegetation communities are not present in the Project study area.

Common Name Scientific Name	Listing Status1	Habitat	Elevation	Bloom	Potential to Occur in Project Study Area
Phlox-leaf serpentine bedstraw (*Galium andrewsii* ssp. *gatense*)	–/–/4.2	Chaparral, cismontane woodland, lower montane coniferous forest; rocky, serpentinite substrates.	490–4,755 feet.	Feb–Apr.	**Moderate[1].** The Project study area is outside the known range of this plant species. There is potential suitable habitat for this plant species within the Project study area in the form of chaparral and cismontane woodland. There are no CNDDB occurrences of this plant species within 5 miles of the Project study area. Species has been observed in the eastern portion of the study area for the larger Pacheco Reservoir Expansion Project east of the Project study area. On a scale of 1.0 to 6.5, this plant species has a mean ultramafic affinity of 5.1: a broad endemic. It is included within a group of 82 taxa with 85 to 94% of their occurrences on ultramafics (such as serpentine). Serpentine soils and serpentine specific vegetation communities are not present in the Project study area.
Coastal Iris (*Iris longipetala*)	–/–/4.2	Coastal prairie, lower montane coniferous forest, meadows, and seeps; mesic habitats.	0–1,970 feet.	Mar–May.	**Absent.** The Project study area is outside of the known range of this plant species. The Project study area lacks suitable habitat for this plant species. There are no CNDDB occurrences of this plant species within 5 miles of the Project study area.
Serpentine leptosiphon (*Leptosiphon ambiguus*)	–/–/4.2	Cismontane woodland, coastal scrub, valley, and foothill grassland, usually serpentinite.	390–3,705 feet.	Mar–Jun.	**Low.** The Project study area is within the known range of this plant species. There is potential suitable habitat for this plant species within the Project study area in the form of valley and foothill grassland and cismontane woodland. There are no CNDDB occurrences of this plant species within 5 miles of the Project study area. On a scale of 1.0 to 6.5, this plant species has a mean ultramafic affinity of 6.1: a strict endemic. It is included within a group of 164 taxa with 95% of their occurrences on ultramafics (such as serpentine). Serpentine soils and serpentine specific vegetation communities are not present in the Project study area.

Common Name Scientific Name	Listing Status1	Habitat	Elevation	Bloom	Potential to Occur in Project Study Area
Large-flowered leptosiphon (*Leptosiphon grandiflorus*)	–/–/4.2	Typically found in sandy soils within coastal strand, foothill woodland, northern coastal scrub, coastal sage scrub, closed-cone pine forest, valley grassland, or coastal prairie habitats.	0-4,000 feet.	Apr-Aug.	**Moderate[1].** The Project study area is within the range of the species. This species has been identified both north and south of Pacheco Pass during previous efforts for the larger Pacheco Reservoir Expansion Project but outside the Project study area. There are no CNDDB occurrences of this plant species within 5 miles of the Project study area.
Mt. Hamilton coreopsis (*Leptosyne hamiltonii*)	–/–/1B.2	Rocky cismontane woodland.	1,800–4,265 feet.	Mar–May.	**Absent.** The Project study area is within the known geographic range of this plant species, but the Project study area lacks the elevational profile within which this plant species is known to occur. All the CNDDB occurrences of this plant species are between 1,800 to 2,600 feet. Only portions of the highest ridges within the central portion of the Project study area associated with Pacheco Reservoir and the North Fork of Pacheco Creek exceed 1,000 feet in elevation. The highest point within the Project study area is 1,275 feet. The Project study area lacks potential suitable habitat in the form of rocky cismontane woodland. There are no CNDDB occurrences of this plant species within 5 miles of the Project study area.
Smooth lessingia (*Lessingia micradenia* var. *glabrata*)	–/–/1B.2	Chaparral, cismontane woodland, valley, and foothill grassland; serpentinite substrates, often roadsides.	390–1,380 feet.	Apr–Jun.	**Low**. The Project study area is within the known range of this plant species. There is potential suitable habitat for this plant species within the Project study area in the form of roadsides, valley and foothill grassland, chaparral, and cismontane woodland. There are no CNDDB occurrences within 5 miles of the Project study area. On a scale of 1.0 to 6.5, this plant species has a mean ultramafic affinity of 5.1: a broad endemic. It is included within a group of 82 taxa with 85 to 94% of their occurrences on ultramafics (such as serpentine). Serpentine soils and serpentine specific vegetation communities are not present in the Project study area.

Common Name Scientific Name	Listing Status1	Habitat	Elevation	Bloom	Potential to Occur in Project Study Area
Spring lessingia (*Lessingia tenuis*)	–/–/4.3	Openings in chaparral, cismontane woodland, lower montane coniferous forest.	980–7,055 feet.	May–Jul.	**Moderate.** The Project study area is within the known range of this plant species. The majority of the elevational profile of the Project study area is below the known elevational range at which this plant species occurs; only portions of the highest ridges within the Project study area associated with Pacheco Reservoir and the North Fork Pacheco Creek exceed 1,000 feet in elevation. There is potential suitable habitat for this plant species within the Project study area in the form of openings in chaparral and cismontane woodland. There are no CNDDB occurrences of this plant species within 5 miles of the Project study area.
Hall's bush-mallow (*Malacothamnus arcuatus* var. *elmeri* [syn. *Malacothamnus hallii*])	–/–/1B.2	Chaparral, coastal scrub.	30–2,495 feet.	Apr–Sep.	**Present[1].** Documented within the Project study area during plant surveys. The Project study area is within the known range of this plant species. There is potential suitable habitat for this plant species within the Project study area in the form of chaparral. There are four CNDDB occurrences of this plant species within 5 miles of the Project study area.
Woodland woolythreads (*Monolopia gracilens*)	–/–/1B.2	Openings in broadleafed upland forest, chaparral, cismontane woodland, North Coast coniferous forest; valley and foothill grassland; occasionally on serpentine.	325–3,935 feet.	Feb–Jul.	**Present[1].** Documented within the Project study area during plant surveys. The Project study area is within the known range of this plant species. There is potential suitable habitat for this plant species within the Project study area in the form of valley and foothill grassland, chaparral, and cismontane woodland. There are no CNDDB occurrences of this plant species within 5 miles of the Project study area. On a scale of 1.0 to 6.5, this plant species has a mean ultramafic affinity of 2.4: a weak indicator. It is included within a group of 150 taxa with 55 to 64% of their occurrences on ultramafics (such as serpentine). Serpentine soils and serpentine specific vegetation communities are not present in the Project study area.
Lime Ridge navarretia (*Navarretia gowenii*)	–/–/1B.1	Chaparral	590–1,000 feet.	May–Jun.	**Low.** The Project study area is outside the known range of this plant species. There is potential suitable habitat for this plant species in the Project study area. There are no CNDDB occurrences of this plant species within 5 miles of the Project study area.

Common Name Scientific Name	Listing Status1	Habitat	Elevation	Bloom	Potential to Occur in Project Study Area
Shining Navarretia (*Navarretia nigelliformis* ssp. *radians*)	–/–/1B.2	Cismontane woodland, valley and foothill grassland, vernal pools, sometimes clay soils.	210–3,280 feet.	Mar–Jul.	**Moderate**. The Project study area is within the known range of this plant species. There is potential suitable habitat for this plant species within the Project study area in the form of cismontane woodland and valley and foothill grassland. There are no CNDDB occurrences of this plant species within 5 miles of the Project study area.
Prostrate vernal pool navarretia (*Navarretia prostrata*)	–/–/1B.1	Coastal scrub, meadows and seeps, valley, and foothill grassland (alkaline); vernal pools; mesic areas.	0–3,970 feet.	Apr–Jul.	**Absent[1].** The Project study area is outside of the known range of this plant species. The Project study area lacks suitable habitat for this plant species. Species was previously detected within the vicinity of San Felipe Lake during previous efforts for the larger Pacheco Reservoir Expansion Project. There are no CNDDB occurrences of this plant species within 5 miles of the Project study area.
Michael's rein orchid *(Piperia michaelii*)	–/–/4.2	Coastal bluff scrub, closed-cone coniferous forest, chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest.	0–3,000 feet.	Apr–Aug.	**High[1].** The Project study area is within the known range of this plant species. There is potential suitable habitat for this plant species within the Project study area in the form of chaparral and cismontane woodland. There are no CNDDB occurrences of this plant species within 5 miles of the Project study area. Species has been observed in the eastern portion of the Pacheco Reservoir Expansion Project study area east of the Project study area.
Hairless popcornflower (*Plagiobothrys glaber*)	–/–/1A	Meadows and seeps (alkaline), marshes and swamps (coastal salt).	45–590 feet.	Mar–May.	**Absent.** The Project study area is outside of the range of this plant species. The Project study area lacks suitable habitat for this plant species. There are no CNDDB records of this plant species within 5 miles of the Project study area.

Common Name Scientific Name	Listing Status1	Habitat	Elevation	Bloom	Potential to Occur in Project Study Area
Chaparral harebell (*Ravenella exigua*)	–/–/1B.2	Chaparral (rocky, usually serpentinite).	900–4,100 feet.	May–Jun.	**Low.** The Project study area is within the known range of this plant species. There is potential suitable habitat for this plant species within the Project study area in the form of chaparral scrub. There are no CNDDB occurrences of this plant species within 5 miles of the Project study area. On a scale of 1.0 to 6.5, this plant species has a mean ultramafic affinity of 3.9: a broad endemic/strong indicator. It is included within a group of 71 taxa with 75-84% of their occurrences on ultramafics (such as serpentine). Serpentine soils and serpentine specific vegetation communities are not present in the Project study area.
Most beautiful jewelflower (*Streptanthus albidus* ssp. *peramoenus*)	–/–/1B.2	Chaparral, cismontane woodland, valley and foothill grassland, serpentinite substrates.	310–3,280 feet.	Mar–Sep.	**Moderate[1].** The Project study area is within the known range of this plant species. There is potential suitable habitat for this plant species within the Project study area in the form of valley and foothill grassland and cismontane woodland. Species has been observed in the eastern portion of the Pacheco Reservoir Expansion Project study area east of the Project study area. There are no CNDDB occurrences of this plant species within 5 miles of the Project study area. On a scale of 1.0 to 6.5, this plant species has a mean ultramafic affinity of 4.3: a transition from broad endemic to a strong indicator. It is included within a group of 71 taxa with 75 to 84% of their occurrences on ultramafics (such as serpentine). Serpentine soils and serpentine specific vegetation communities are not present in the Project study area.
Saline clover (*Trifolium hydrophilum*)	–/–/1B.2	Marshes and swamps, valley, and foothill grassland (mesic, alkaline), vernal pools.	0–985 feet.	Apr–Jun.	**Absent[1].** The Project study area is outside of the range of this plant species. The Project study area lacks suitable habitat for this plant species. Species was previously detected within the vicinity of San Felipe Lake during previous efforts for the larger Pacheco Reservoir Expansion Project. There are no CNDDB records of this plant species within 5 miles of the Project study area.

Notes:

1) Species documented during focused botanical surveys in 2020 for the larger Pacheco Reservoir Expansion Project, which included areas outside of the Project study area. Attachment 2 provides further details regarding the results of the botanical surveys.

[1]Status Codes: Federal and State Codes: E = Endangered; T = Threatened; R= Rare.

CRPR Codes:

List 1A	Plants presumed extinct in California.
List 1B	Plants rare, threatened, or endangered in California and elsewhere.
List 2	Plants rare, threatened, or endangered in California but more common elsewhere.
List 3	Plants for which we need more information – Review list.
List 4.	Plants of limited distribution.

Extensions: x.1 - Seriously endangered in California; x.2 - Fairly endangered in California; x.3 - Not very endangered in California.

Table 2-3. Special-Status Wildlife Species with Potential to Occur in the Project Study Area

Common Name Scientific Name	Listing Status[1] (Fed/State)	Habitat Requirements	Potential for Occurrence in Project Study Area
Invertebrates			
Vernal pool fairy shrimp (*Branchinecta lynchi*)	T/–	Grass or mud-bottomed swales, earth slump or basalt-flow depression pools in grasslands.	**Absent.** The Project study area is located outside of the known species range (USFWS 2024a). No CNDDB occurrences are documented in or within 5 miles of the Project study area. The Project study area does not support habitat for this species.
Monarch butterfly (*Danaus plexippus plexippus*)	FC/–	Monarch butterflies depend on milkweed sp. as a nectar and host plant, along with other species for nectar plants for adults including thistle sp. (*Carduus* sp.) and purple loosestrife (*Lythrum salicaria*). Migratory and breeding habitat consists of the same characteristics: Milkweed sp., nectar plants, and places to roost (trees and shrubs). The host and nectar plants for monarchs grow in a variety of vegetation communities including forests, woodlands, chaparral, and grasslands.	**Moderate:** The Project study area is within the range of the species. Potential suitable breeding and migration habitat occur adjacent to and upstream of Pacheco Reservoir. The Project study area does not support overwintering habitat. Only overwintering occurrences of the species is tracked in CNDDB, and no overwintering occurrences are within 5 miles of the Project study area.
Western bumble bee (*Bombus occidentalis*)	-/CE	Once common and widespread, this species has declined precipitously from central California to southern B.C.	**Absent.** The Project study area is outside the range of the species. In California, populations of this species are currently largely restricted to high elevation sites in the Sierra Nevada (CDFW 2023f).
Crotch's bumble bee (*Bombus crotchii*)	-/CE	Coastal California east to the Sierra-Cascade crest and south into Mexico. Food plant genera include but are not limited to *Asclepias*, Salvia, *Lupinus, Vicia, Acmispon*, *Phacelia*, *Eschscholzia*, and *Centaurea*.	**High.** The Project study area is in the range of the species. The Project study area supports suitable habitat for this species.. No CNDDB occurrences are documented within 5 miles of the Project study area, although there is one recent occurrence documented approximately 5.5 miles east of the Project study area in Upper Cottonwood Creek Wildlife Area (Bumble Bee Watch 2024)
Bay checkerspot butterfly (*Euphydryas editha bayensis*)	T/–	Found in shallow, serpentine-derived soils in valley and foothill grassland; strong association to host plants dwarf plantain (*Plantago erecta*) and purple owl's clover (*Castelleja densiflora* or *C. exerta*).	**Absent:** The study area is located outside of the known species range (USFWS 2024b). No CNDDB occurrences are documented in or within 5 miles of the study area.

Common Name Scientific Name	Listing Status[1] (Fed/State)	Habitat Requirements	Potential for Occurrence in Project Study Area
Amphibians			
California tiger salamander (*Ambystoma californiense*)	T/T	Requires seasonally inundated aquatic habitats: ponds, wetlands, and vernal pools for breeding with associated upland terrestrial habitat. Utilizes small mammal burrows within upland habitat.	**High**. The species has been observed and documented within 5 miles of the Project study area within the last 5 years and (seasonally inundated aquatic pond) habitat for the species is present near the Project study area. There are multiple CNDDB occurrences of this species within 5 miles of the Project study area.
Foothill yellow-legged frog **(***Rana boylii*)	PT/SE	Requires seasonal to perennial partly shaded, shallow streams and riffles with a rocky substrate in a variety of habitats. Need at least some cobble-sized substrate for egg laying. Foothill yellow-legged frogs occupy a diverse range of ephemeral, intermittent, seasonal, and permanent streams, rivers, and adjacent moist terrestrial habitats over the course of their complex life history (U.S. Department of Agriculture 2016). Foothill yellow-legged frog move up into tributaries in the event of stream dry backs (Gonsolin, 2010), and have been known to breed in ponds adjacent to stream aquatic habitat in Sonoma County when predators (e.g., bullfrogs) have been removed. (Willcox and Alvarez, 2019).	**Moderate**. The species has been observed and documented within 5 miles of the Project study area and the Project study area is within the range for the species. There is 1 CNDDB occurrence of this species within the Project study area from 1950, on mainstem Pacheco Creek. Suitable aquatic habitat occurs primarily upstream of North Fork Dam along North Fork Pacheco Creek.
California red-legged frog (*Rana draytonii*) Critical Habitat	T/SSC	Requires perennial or near-perennial aquatic habitats, especially for breeding: streams, freshwater pools, and ponds over 1-foot deep with overhanging vegetation.	**High**. The species was observed within the Pacheco Reservoir Expansion Project study area on May 7, 2020, and documented within 5 miles of the Project study area within the last 5 years. Habitat for the species is present in the Project study area in the form of perennial stream or pond and surrounding upland vegetated areas. There are multiple CNDDB occurrences of this species either in or within 5 miles of the Project study area. The Project study area is within critical habitat for this species.

Common Name Scientific Name	Listing Status[1] (Fed/State)	Habitat Requirements	Potential for Occurrence in Project Study Area
Western spadefoot toad (*Spea hammondii*)	–/SSC	Grasslands with temporary pools within mixed woodland, coastal sage scrub, chaparral, lowlands, and floodplains in gravelly or sandy soils. Require both temporary pools for reproduction and upland habitat for constructing burrows and foraging.	**Absent.** The Project study area is located outside of the known species range (CDFW 2024a). No CNDDB occurrences are documented in or within 5 miles of the Project study area.
Coast range newt (*Taricha torosa*)	–/SSC (Monterey County and south only)	Found in grasslands, woodlands, and conifer forest; requires ponds, reservoirs, and slow-moving streams for breeding.	**SCC Population Absent.** The Project study area is outside of the portion of this species' range that has SCC status (Monterey County and south only) (CDFW 2024b). Coast range newts occurring in the Project study area are not a California Species of Special Concern (SSC).
Reptiles			
Northwestern pond turtle **(***Actinemys marmorata*)	PT/SSC	Slow water aquatic habitat with available basking sites. Hatchlings require shallow water with dense submergent or short emergent vegetation. Require an upland oviposition site in the vicinity of the aquatic site.	**Present.** The species is known to be present and has been observed just outside the Project study area near the confluence of the North Fork Pacheco Creek and South Fork Pacheco Creek during a site visit on 8/8/2019. There are multiple CNDDB occurrences of this species either in or within 5 miles of the Project study area.
Silvery legless lizard (*Aniella pulchra pulchra)*	–/SSC	Occurs in areas with sandy or loose loamy soils, often areas under sparse vegetation including beaches, chaparral, or pine-oak woodland; often near riparian vegetation along stream terraces.	**Moderate**. The Project study area is located within the range of the species and potential (chaparral, oak woodland, and riparian) habitat for the species exists in the Project study area. No CNDDB occurrences are known from the Project study area or within 5-miles.
San Joaquin coachwhip *(Masticophis flagellum ruddocki*)	–/SSC	Found in grassland, desert, scrub, chaparral, and pasture habitats.	**Moderate**. The Project study area is located within the range of the species; potential (grassland, chaparral, and pasture) habitat for the species is present in the Project study area. No CNDDB occurrences are known from the Project study area or within 5 miles.

Common Name Scientific Name	Listing Status[1] (Fed/State)	Habitat Requirements	Potential for Occurrence in Project Study Area
Coast horned lizard (*Phrynosoma blainvillii*)	–/SSC	Found in a wide variety of habitats, most common in lowlands along sandy washes with scattered low bushes. Uses open areas for sunning, bushes for cover, patches of loose soil for burial, and abundant supply of ants and other insects. Occurs in the Sierra Nevada foothills throughout the central and southern California coast.	**High**. The Project study area is located within the range of the species. Habitat (grassland and riparian) for the species exists in the Project study area. No CNDDB occurrences are known from the Project study area or within 5 miles Species has been observed in the Pacheco Reservoir Expansion Project study area north of the Project study area.
Birds			
Grasshopper sparrow (*Ammodramus savannarum*)	–/SSC	Nests and forages in grasslands, meadows, fallow fields, and pastures; also known to inhabit grasslands with scattered shrubs.	**Moderate**. The Project study area is located within the range of the species and potential (nesting and foraging) habitat for the species exists in the Project study area. There are no CNDDB occurrences within 5 miles of the Project study area
Tricolored blackbird (*Agelaius tricolor*)	–/T	Breeds near fresh water in dense emergent vegetation. Requires open water, protected nesting substrate, and foraging area with insect prey within a few km of the colony.	**Moderate.** The species has been observed and documented within 5 miles of the Project study area within the last 5 years. Foraging habitat (grassland) for the species is present in the Project study area. No breeding habitat (emergent marsh, riparian areas, or pond fringes consisting of cattails, tules, or brambles) is present within or in the vicinity of the Project study area. There is one CNDDB occurrence known within 5 miles of the Project study area.
Golden eagle (*Aquila chrysaetos*)	–/FP	Inhabit forests, canyons, shrublands, grasslands and oak woodlands often nests on cliffs or in the large trees with unobstructed views.	**Present.** The species is known to be present and has been observed in flight throughout the Project study area during multiple site visits during surveys from 2019 – 2023. Potential (nesting and foraging) habitat is present within the Project study area.
Long eared-owl (*Asio otus*)	–/SSC	Nest in bottomlands with tall, dense vegetation, often dense willow, cottonwood, or dense upland conifer or woodland vegetation for roosting. Requires adjacent open areas such as grasslands, meadows, or shrublands for foraging.	**Moderate.** The Project study area is located within the range of the species, and potential (nesting and foraging) habitat for the species exists in the Project study area. There are no CNDDB occurrences within 5 miles of the Project study area.

Common Name Scientific Name	Listing Status[1] (Fed/State)	Habitat Requirements	Potential for Occurrence in Project Study Area
Western burrowing owl (*Athene cunicularia*)	–/SSC	Grasslands and ruderal habitats. Uses mammal burrows or other suitable underground cavities.	**Moderate**. The Project study area is located within the range of the species, and potential grasslands and ruderal (foraging, movement, overwintering) habitat for the species exists in the Project study area. Breeding not expected given the high elevations. Western burrowing owl may overwinter only in the project area as migrants from up north come down. Potential burrows were observed scattered throughout the site. There are no CNDDB occurrences within 5 miles of the Project study area.
Swainson's hawk (*Buteo swainsoni*)	–/T	Breeds in stands with few trees in juniper-sage flats, riparian areas, and oak savannah; forages in adjacent livestock pasture, grassland, or grain.	**Moderate**. The Project study area is located within the range of the species; potential (riparian nesting and livestock grazing) habitat for the species exists in the Project study area. There are no CNDDB occurrences in the Project study area or within 5 miles.
Northern harrier (*Circus cyaneus*)	–/SSC	Forages in marshes, grasslands, and ruderal habitats; nests in extensive marshes and wet fields.	**Present**. The Project study area is located within the range of the species and potential (limited open grassland, agricultural pasture, or wetland) habitat for the species is present in the Project study area. This species has also been observed in the Project study area.
Vaux's swift (*Chaetura vauxi*)	–/SSC	Nests in coastal conifer forests; and occasionally in chimneys; requires adjacent foraging habitat.	**Absent as Breeder.** The Project study area is located outside of the known species breeding range (CDFW 2024c). Although this species is tracked by CNDDB, no CNDDB occurrences have been reported for this species. There are non-CNDDB observations of this species within 5 miles of the Project study area east and west of the Project study area along SR 152. Therefore, the Project study area may be used for foraging and as a migratory corridor for the species.
Olive-sided flycatcher (*Contopus cooperi*)	–/SSC	Nests in mature conifer forest with open canopies, along forest edges; often in recently burned areas and in harvested areas.	**Absent as Breeder.** The Project study area is located outside the breeding range of the species (CDFW 2024d). Although this species is tracked by CNDDB, there are no CNDDB occurrences that have been reported for this species. There are species observations within 5 miles east of the Project study area.
Yellow warbler (*Setophaga petechia*)	–/SSC	Occupies riparian habitats along streamside's and wet meadows; often found in willows and cottonwoods and willows, but also found in numerous other riparian tree species in California.	**Moderate**. The Project study area is located within the range of the species and potential (riparian nesting and foraging) habitat for the species is present downstream of the North Fork Dam in the Project study area. There are no CNDDB occurrences within 5 miles of the Project study area.

Common Name Scientific Name	Listing Status[1] (Fed/State)	Habitat Requirements	Potential for Occurrence in Project Study Area
White-tailed kite (*Elanus leucurus*)	–/FP	Nests in tall shrubs and trees, forages in grasslands, agricultural fields, and marshes.	**High**. The Project study area is located within the range of the species; and potential (nesting tree and foraging) habitat for the species exists in the Project study area. No CNDDB occurrences are known from the Project study area or within 5 miles; however, the species has been observed along Kaiser-Aetna Road within 5 miles of the Project study area.
California condor (*Gymnogyps californianus*)	E/E, FP	Nests in caves on cliff faces often surrounded by dense brush; forages up to 100 miles from nest site.	**High.** The Project study area is located within the range of the species, and nesting (cliff) habitat is not present in the Project study area. However, foraging and roosting habitat is present throughout the Project study area. While there are no CNDDB occurrences within 5 miles of the Project study area, there are published observations of the species within the immediate vicinity of the Project study area.
Bald eagle (*Haliaeetus leucocephalus*)	–/E	Found near rivers, lakes, marshes, where abundant food supply is nearby. Require perching areas and nesting sites.	**Present**. The species is known to be present and has been observed in flight throughout the Project study area during multiple site visits during surveys from 2019 – 2023. Potential (nesting and foraging) habitat is present within the Project study area.
American peregrine falcon (*Falco peregrinus anatum*)	–/SOI	Typically nests on ledges of large cliff faces; also nests on city buildings, bridges, and tree cavities of coastal redwoods	**High.** The Project study area is located within the range of the species. While this species may also occupy city buildings and tree cavities of coastal redwoods, which are absent from the Project study area; the species may forage in the grassland and chaparral in the Project study area. No nesting habitat is present for American peregrine falcon within the Project study area. No CNDDB occurrences are within the Project study area or within 5 miles. However, this species has been observed in the portion of the Pacheco Reservoir Expansion Project study area within Henry Coe State Park.
Yellow-breasted chat (*Ilcteria virens*)	–/SSC	Found in the lower elevations of mountains in riparian habitat in the foothills of the Sierra Nevada and coastal California as an uncommon summer resident and migrant. Breeds in the coastal southern and inland southern California habitats.	**Moderate**. The Project study area is located within the range of the species, and potential (perching and nesting) riparian habitat for the species exists in the Project study area. No CNDDB occurrences are within 5 miles of the Project study area

Common Name Scientific Name	Listing Status[1] (Fed/State)	Habitat Requirements	Potential for Occurrence in Project Study Area
Loggerhead shrike *(Lanius ludovicianus)*	–/SSC	Breeds in tall shrubs and dense trees, often in shrublands or open woodlands; requires adjacent grasslands, marshes, ruderal areas for foraging.	**Moderate**. The Project study area is located within the range of the species, and potential (perching and nesting) shrubland and open woodland habitat for the species exists in the Project study area. No CNDDB occurrences are within the Project study area or within 5 miles.
Purple martin (*Progne subi*)	–/SSC	Inhabits valley and montane hardwood, riparian, conifer, habitats as well as open habitats during near water bodies during migration. Nests in cavities, typically snags with woodpecker holes and sometimes cavities in nesting boxes and utility poles.	**Moderate**. The Project study area is located just outside the range of the species (CDFW 2024e), and potential (foraging and breeding) habitat for the species is present in the Project study area. No CNDDB occurrences are known from within 5 miles of the Project study are.
Least Bell's vireo (*Vireo bellii pusillus*)	E/E	Found in riparian habitats along flowing water and in desert habitats, found along dry watercourses with dense vegetation. Requires dense riparian shrubbery breeding and above-ground nesting.	**Low**. The Project study area is within the historic range of the species. Low quality riparian foraging habitat for the species exists in the downstream reaches of Project study area. Riparian areas within and in the vicinity of the Project study area consist of mature riparian stands rather than the expansive, early successional scrub/shrub areas required by the species for nesting. There are no CNDDB occurrences within 5 miles of the Project study area.
Mammals			
Pallid bat (*Antrozous pallidus*)	–/SSC	Forages over many habitats; roosts in buildings, bridges, trees, rocky outcrops and rocky crevices in mines and caves.	**Moderate**. The Project study area is located within the range of the species. Roosting and foraging habitat for the species is present in the Project study area. There is one historical CNDDB occurrence (#250) just outside the Project study area from 1937 and updated occurrence 10/3/2006 located near SR 152 and Kaiser-Aetna Rd.
Ringtail (*Bassariscus astutus*)	–/FP	Occurs in various riparian, brush, forest, and shrub habitats at low to mid elevations. Nests in rock recesses, hollow trees, logs, snags, abandoned burrows or woodrat nests.	**Moderate.** The Project study area is located within the range of the species and potential habitat for the species exists in the Project study area in the form of riparian, brush, forest, and shrub habitats. Nesting habitat also occurs within the Project study area. This species is not tracked by CNDDB, and there are no public observations of this species within 5 miles of the Project study area.

Common Name Scientific Name	Listing Status[1] (Fed/State)	Habitat Requirements	Potential for Occurrence in Project Study Area
Tule Elk (*Cervus canadensis nannodes*)	–/SOI	Occurs in various grassland, shrubland, woodland habitats. Grazes typically in open habitats and moves to areas with more cover during calving season.	**Present.** The Project study area is located within the range of the species, and potential habitat is present in the Project study area as grasslands, shrub/chapparal, and woodland habitats. The species is not tracked by the CNDDB, but there are numerous observations of the species within 5 miles of the Project study area. In addition, a tule elk was tracked during a CDFW radio telemetry through the Project study area near Pacheco Reservoir.
Townsend's bat (*Corynorhinus townsendii*)	–/SSC	Found in all but subalpine and alpine habitats and can be found at any season throughout its range. It is most common in mesic habitats. This species requires caves, mines, tunnels, buildings, other human-made structures including bridges, or other cave analogs (such as large hollow redwood trees) for roosting.	**High**. There is a CNDDB occurrence from 1995 for this species just outside the Project study area from under the SR 152 bridge over Pacheco Creek.. Roosting and foraging habitat for the species is present in the Project study area, including in the immediate vicinity of the CNDDB occurrence.
Western mastiff bat (*Eumops perotis californicus*)	–/SSC	Found in open, semi-arid to arid habitats, including conifer, deciduous woodland, coastal scrub, grasslands, palm oasis, chaparral, desert scrub and urban. Nests in cliff faces crevices, high buildings, trees, and tunnels for roosting.	**Moderate.** The Project study area is located within the range of the species and nesting and foraging habitat is present. There are no CNDDB occurrences for this species within 5 miles of the Project study area.
Western red bat (*Lasiurus frantzii* [*blossevillii*])	–/SSC	Typically roost solitarily in dense tree foliage, particularly in willows, cottonwoods, and sycamores as well as conifer forests. Strongly associated with riparian habitats, often mature stands of cottonwood/sycamore. Forages in grassland, shrubland, open woodland, forest, and agricultural habitats.	**Moderate.** The Project study area is located within the range of the species; and potential (tree foliage roosting) habitat for the species is present in the Project study area. There are no CNDDB occurrences for this species within 5 miles of the Project study area.
Dusky-footed woodrat (*Neotoma fuscipes annectens)*	–/SSC	Occurs in a variety of woodland and scrub habitats, often in riparian and oak woodland forests with dense understory cover, or thick chaparral habitat.	**High.** The Project study area is located within the range of this species, and suitable habitat is present within the Project study area. There are no CNDDB for this species within 5 miles of the Project study area, but has been observed within 5 miles of the Project study area by Santa Clara Valley Habitat Agency staff.

Common Name Scientific Name	Listing Status[1] (Fed/State)	Habitat Requirements	Potential for Occurrence in Project Study Area
Mountain lion (*Pumas concolor*)	-/CT	Mountain lions occur within a variety of habitats including pine forests, oak woodlands and savannahs, riparian woodlands, chaparral, and grasslands. They require large amounts of undisturbed habitat for dispersal and foraging, and individuals are territorial and live a solitary life (except for breeding). Mountain lion prey consists of mainly deer, with other large and small mammals making up a smaller portion of prey, including livestock, wild horses and hogs, and coyotes.	**Present**. Sign (i.e., scat) of the species has been documented during surveys within the Pacheco Reservoir Expansion Project study area, including sightings within the Project study area, primarily north of the existing North Fork Dam. All terrestrial habitat adjacent to and upstream of the existing Pacheco Reservoir is suitable habitat for mountain lions. This species is not tracked by the CNDDB.
American badger *(Taxidea taxus*)	–/SSC	Herbaceous, shrub, and open stages of most habitats with dry, friable, often uncultivated soils; require sufficient food sources (feeds mostly on burrowing rodents).	**High**. The Project study area is located within the range of the species; there are documented occurrences within 5 miles of the Project study area, and/or potential (open herbaceous and shrub) habitat for the species exists in the Project study area. There are five CNDDB occurrences within 5 miles of the Project study area.
San Joaquin kit fox (*Vulpes macrotis mutica*)	E/T	Found in annual grassland and various scrub and subshrub habitats. Requires dens for shelter and breeding.	**Low**. The Project study area is located within the range of the species. This species typically inhabits grassland areas on slopes less than 5%; therefore, moderate to steep sloping grassland within the Project study area offers only atypical habitat with limited suitability. There are three CNDDB occurrences within 5 miles of the Project study area.

Notes:

[1]Status Codes: Federal and State Codes: D = Delisted, E = Endangered; T = Threatened; PT= Proposed Threatened; CT= Candidate Threatened; CE= Candidate Endangered; FP = Fully Protected; FC= Federal Candidate; SSC= CDFW Species of Special Concern; NL-Not Listed.

Chapter 3. Summary of Results

3.1 Botanical Special-Status Species

The focused botanical surveys were conducted over the course of six botanical survey periods in 2020 and 2023, and a total of two special-status plant species comprised of two occurrences were identified in the Project study area. Non-native invasive plant mapping was also performed during the focused botanical survey efforts and resulted in the identification of four different species totaling six occurrences in the Project study area. Further details on the methods and findings of the botanical surveys can be found in the *Botanical Special-Status Species Assessment* included as Attachment 2.

3.2 California Red-legged Frog and California Tiger Salamander Habitat Assessments

Biologists conducted protocol habitat assessment surveys and visual observations within the Project study area and standard USFWS recommended buffer areas, where access was permitted, for CRLF and CTS. The results of the CTS habitat assessment included the identification of 65 aquatic habitat features located within 1.24 miles of the study area. Of the 65 aquatic habitat features, 50 provide the essential components of CTS breeding habitat. The remaining 15 aquatic features either provide low quality or do not provide suitable conditions to be considered breeding habitat for CTS. For CRLF, the habitat assessment identified 54 aquatic habitat features within 1 mile of the study area. Of these 54 aquatic features, 40 provide the essential components of CRLF breeding habitat, and the remaining 14 features either provide low quality or do not provide suitable conditions to be considered breeding habitat for CRLF. Additional information on the CTS and CRLF site assessment methods and findings are provided in the *California Red-legged Frog Site Assessment* and *California Tiger Salamander Site Assessment* in Exhibit 1C and Exhibit 1D, respectively.

3.3 Other Special-Status Wildlife Species Habitat Assessments

In addition to the CRLF and CTS habitat assessments described above, below is a list of special-status species (excluding fish and eagles) that have a potential to occur within the Project study area as discussed in Table 2-3 above. Excluding these species (CRLF, CTS, fish and eagles) there are 33 remaining special-status wildlife species that have a potential to occur as listed below. Potential to occur for these species was based on pedestrian surveys, along with the results from the *Aquatic Resources Delineation* and *Terrestrial Vegetation Community Mapping* attachment. Information associated with species listed below is found in Exhibit 1E O*ther Special-Status Wildlife Species Habitat Assessment*.

Insects

- Crotch's bumble bee (*Bombus crotchii*)
- Monarch butterfly (Danaus plexippus plexippus)

Herpetofauna

- Silvery legless lizard (*Aniella pulchra pulchra*)
- Northwestern pond turtle (*Actinemys marmorata*)
- San Joaquin coachwhip (Masticophis flagellum ruddocki)
- Coast horned lizard (*Phrynosoma blainvillii*)

- Foothill yellow-legged frog (*Rana boylii*)

Birds

- Tricolored blackbird (*Agelaius tricolor*)
- Grasshopper sparrow (*Ammodramus savannarum*)
- Long-eared owl (*Asio otus*)
- Western burrowing owl (*Athene cunicularia*)
- Swainson's hawk (*Buteo swainsoni*)
- Vaux's swift (*Chaetura vauxi*)
- Northern harrier (*Circus cyaneus*)
- Olive-sided flycatcher (*Contopus cooperi*)
- White-tailed kite (*Elanus leucurus*)
- American peregrine falcon (*Falco peregrinus anatum*)
- California condor (Gymnogyps californianus)
- Yellow-breasted chat (*Icteria virens*)
- Loggerhead shrike (*Lanius ludovicianus*)
- Purple martin (*Progne subis*)
- Yellow warbler (Setophaga petechia)
- Least Bell's vireo (*Vireo bellii pusillus*)

Mammals

- Pallid bat (Antrozous pallidus)
- Ringtail (Bassariscus astutus)
- Tule elk (Cervus canadensis nannodes)
- Townsend's big-eared bat (*Corynorhinus townsendii*)
- Western mastiff bat (Eumops perotis californicus)
- Western red bat (Lasiurus blossevillii)
- Dusky-footed woodrat (Neotoma fuscipes annectens)
- Mountain lion (*Pumas concolor*)
- American badger (*Taxidea taxus*)
- San Joaquin kit fox (*Vulpes macrotis mutica*)

Chapter 4. References

Baldwin, B.G., D.H. Goldman, D.J. Keil, R. Patterson, T.J. Rosatti, and D.H. Wilken (eds.). 2012. *The Jepson Manual: Vascular Plants of California*, Second Edition. Berkeley: University of California Press.

Bumble Bee Watch. 2024. Available at: https://www.bumblebeewatch.org/app/#/bees/lists. Accessed February 2024

California Department of Fish and Wildlife (CDFW). 2014. CWHR version 9.0 personal computer program: California Department of Fish and Wildlife, California Interagency Wildlife Task Group.

_____. 2023a. California Natural Diversity Database. RareFind 5 [Internet]. California Department of Fish and Wildlife, Sacramento, California. Available at: https://www.wildlife.ca.gov/ Data/ CNDDB/Maps-and-Data. Accessed September 2023.

_____. 2023b. *State and Federally Listed Endangered, Threatened and Rare Plants of California*. California Department of Fish and Wildlife, Biogeographic Data Branch, California Natural Diversity Database. List updated July 2023. Available online at https://www.wildlife.ca.gov/Data/CNDDB/Plants-and-Animals.

_____. 2023c. *Special Vascular Plants, Bryophytes, and Lichens List*. California Department of Fish and Wildlife, Natural Diversity Database. Periodic publication. 51 pp. List updated July 2023. Available online at https://www.wildlife.ca.gov/Data/CNDDB/Plants-and-Animals.

_____. 2023d. *Special Animals List*. California Department of Fish and Wildlife, Natural Diversity Database. Periodic publication. 51 pp. Updated July 2023. Available online at https://www.wildlife.ca.gov/Data/CNDDB/Plants-and-Animals.

_____. 2023e. *State and Federally Listed Endangered and Threatened Animals of California*. California Department of Fish and Wildlife, Biogeographic Data Branch, California Natural Diversity Database. List updated July 2023. Available online at https://www.wildlife.ca.gov/Data/CNDDB/Plants-and-Animals.

_____. 2023f. Survey Considerations for California Endangered Species Act (CESA) Candidate Bumble Bee Species. June 6, 2023. Available online at: https://wildlife.ca.gov/Conservation/Survey-Protocols#377281281-invertebrates.

_____. 2024a. Western Spadefoot Range - CWHR A028 [ds590] GIS Dataset (ca.gov). Available online at: https://map.dfg.ca.gov/metadata/DS0590.html

_____. 2024b. Coast Range Newt Range - CWHR A007A [ds2850] GIS Dataset (ca.gov). Available online at: https://map.dfg.ca.gov/metadata/DS2850.html

_____. 2024c. Vaux's Swift Range - CWHR B281 [ds1532] GIS Dataset (ca.gov). Available online at: https://map.dfg.ca.gov/metadata/DS1532.html

_____. 2024d. Olive-sided Flycatcher Range - CWHR B309 [ds1555] GIS Dataset. Available online at: https://map.dfg.ca.gov/metadata/DS1555.html

_____. 2024e. Purple Martin Range - CWHR B338 [ds1570] GIS Dataset (ca.gov). Available online at: https://map.dfg.ca.gov/metadata/DS1570.html

California Native Plant Society (CNPS), Rare Plant Program. 2023. Inventory of Rare and Endangered Plants of California (online edition, v8-03 0.39). Website http://www.rareplants.cnps.org.

Gonsolin. T. E. 2010. Ecology of Foothill Yellow-Legged Frogs in Upper Coyote Creek, Santa Clara County, CA. Master's Theses. 3861. Available at: https://scholarworks.sjsu.edu/cgi/viewcontent.cgi?article=4858&context=etd_theses

Jepson Flora Project. 2023. Jepson eFlora. http://ucjeps.berkeley.edu/eflora/.

Santa Clara County. 2012. Santa Clara Valley Habitat Conservation Plan/Natural Community Conservation Plan (HCP/NCCP). Available at: http://www.scv-habitatplan.org/www/default.aspx.

U.S. Department of Agriculture. 2016. Foothill Yellow-Legged Frog Conservation Assessment in California. General Technical Report PSW-GTR-248. August 2016. Available at: https://www.fs.fed.us/psw/publications/documents/psw_gtr248/psw_gtr248.pdf

U.S. Fish and Wildlife Service (USFWS). 2023a. Environmental Conservation Online System. Available online at https://ecos.fws.gov.

_____. 2023b. Critical Habitat Mapper. Available online at https://fws.maps.arcgis.com/home/webmap/viewer.html?webmap=9d8de5e265ad4fe09893cf75b8dbfb77.

_____. 2024a. Vernal pool fairy shrimp (Branchinecta lynchi). Available on line at: https://ecos.fws.gov/ecp/species/498.

_____. 2024b. Bay checkerspot butterfly (Euphydryas editha bayensis). Available on line at: https://ecos.fws.gov/ecp/species/2320.

Wilcox J.T. and J. Alvarez. 2019. Wrestling for Real Estate: Male-male Interactions in Breeding Foothill Yellow-Legged Frogs (*Rana byolii*). Western Wildlife 6:14-17. Accepted 29 April 2019.

Exhibit 1A – USFWS, CNDDB and CNPS Database Results

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

NOT FOR CONSULTATION

Location

Santa Clara County, California



Local office

Sacramento Fish And Wildlife Office

(916) 414-6600
(916) 414-6713

Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846

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Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).

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2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
San Joaquin Kit Fox Vulpes macrotis mutica Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/2873	Endangered

Birds

NAME	STATUS
California Condor Gymnogyps californianus There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/8193	Endangered

Reptiles

NAME	STATUS
Northwestern Pond Turtle Actinemys marmorata Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1111	Proposed Threatened

Amphibians

NAME	STATUS
California Red-legged Frog Rana draytonii Wherever found There is **final** critical habitat for this species. Your location overlaps the critical habitat. https://ecos.fws.gov/ecp/species/2891	Threatened
California Tiger Salamander Ambystoma californiense There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/2076	Threatened

NOT FOR CONSULTATION

Foothill Yellow-legged Frog Rana boylii No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/5133	Threatened

Insects

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate

Flowering Plants

NAME	STATUS
Coyote Ceanothus Ceanothus ferrisae Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/8440	Endangered

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

This location overlaps the critical habitat for the following species:

NAME	TYPE
California Red-legged Frog Rana draytonii https://ecos.fws.gov/ecp/species/2891#crithab	Final

Bald & Golden Eagles

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act[1] and the Migratory Bird Treaty Act[2].

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats[3], should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

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Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

There are bald and/or golden eagles in your project area.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Jan 1 to Aug 31
Golden Eagle *Aquila chrysaetos* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds Jan 1 to Aug 31

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Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

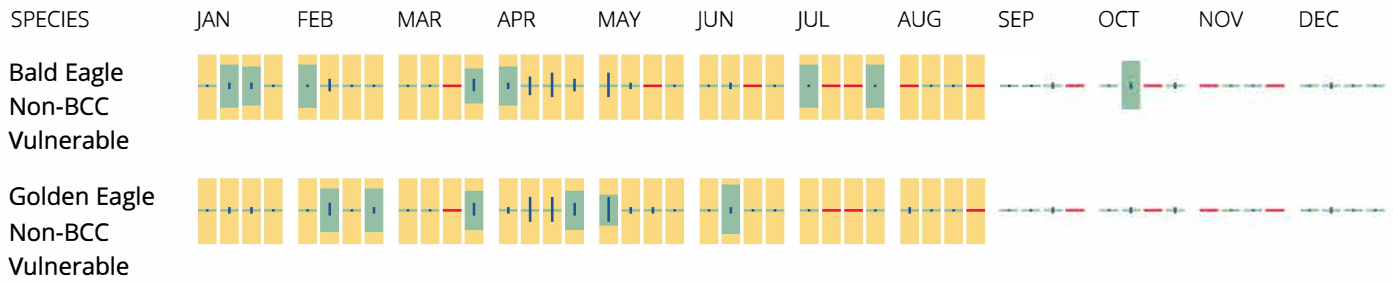
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

▪ probability of presence ▪ breeding season | survey effort – no data

NOT FOR CONSULTATION



What does IPaC use to generate the potential presence of bald and golden eagles in my specified location?

The potential for eagle presence is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply). To see a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs of bald and golden eagles in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur. Please contact your local Fish and Wildlife Service Field Office if you have questions.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

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Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats[3] should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Jan 1 to Aug 31

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Belding's Savannah Sparrow Passerculus sandwichensis beldingi — Breeds Apr 1 to Aug 15

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/8

Bullock's Oriole Icterus bullockii — Breeds Mar 21 to Jul 25

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

California Thrasher Toxostoma redivivum — Breeds Jan 1 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Golden Eagle Aquila chrysaetos — Breeds Jan 1 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/1680

Lawrence's Goldfinch Carduelis lawrencei — Breeds Mar 20 to Sep 20

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9464

Nuttall's Woodpecker Picoides nuttallii — Breeds Apr 1 to Jul 20

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/9410

Oak Titmouse Baeolophus inornatus — Breeds Mar 15 to Jul 15

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9656

Tricolored Blackbird Agelaius tricolor — Breeds Mar 15 to Aug 10

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/3910

NOT FOR CONSULTATION

Wrentit Chamaea fasciata — Breeds Mar 15 to Aug 10

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Yellow-billed Magpie Pica nuttalli — Breeds Apr 1 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9726

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

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Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



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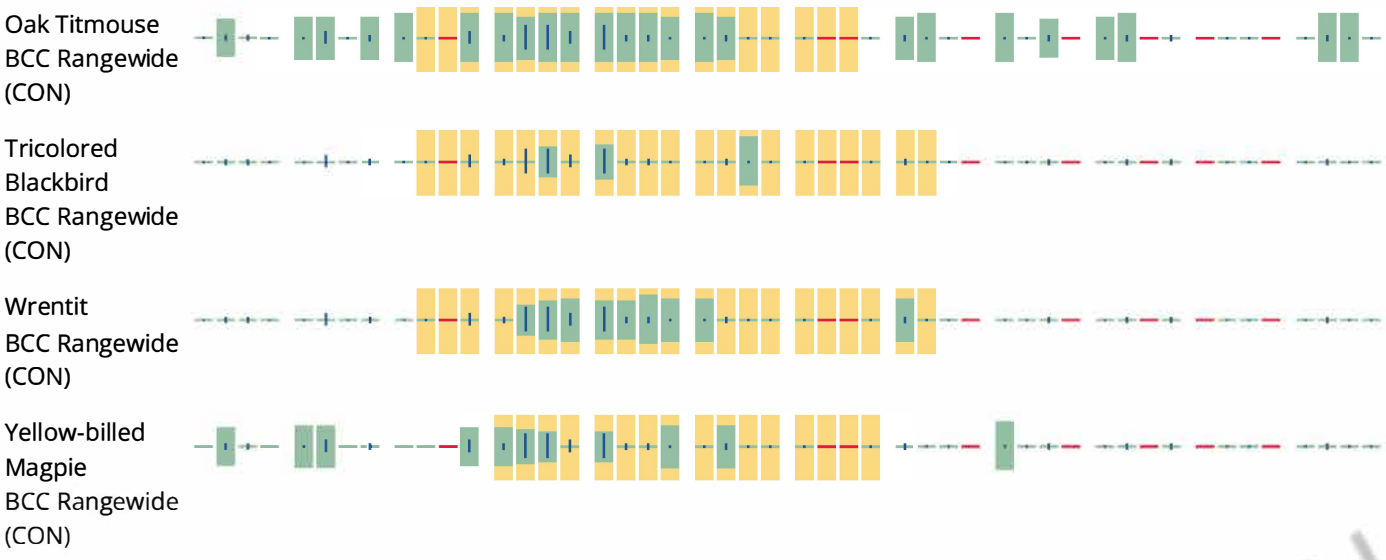

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

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Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

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Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

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Wetlands in the National Wetlands Inventory (NWI)

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER EMERGENT WETLAND

- PEM1B
- PEM1C

LAKE

- L1UBHh

RIVERINE

- R4SBC
- R3UBH
- R3UBF
- R4SBA
- R4SBCx

A full description for each wetland code can be found at the National Wetlands Inventory website

NOTE: This initial screening does **not** replace an on-site delineation to determine whether wetlands occur. Additional information on the NWI data is provided below.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

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The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

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Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Mississippi Creek (3712124) OR Pacheco Peak (3712113) OR Crevison Peak (3712122) OR Gilroy Hot Springs (3712114) OR Pacheco Pass (3712112) OR San Felipe (3612184) OR Three Sisters (3612183) OR Mariposa Peak (3612182))
 AND Taxonomic Group IS (Fish OR Amphibians OR Reptiles OR Birds OR Mammals OR Mollusks OR Arachnids OR Crustaceans OR Insects OR Ferns OR Gymnosperms OR Monocots OR Dicots OR Lichens OR Bryophytes)

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Agelaius tricolor tricolored blackbird	ABPBXB0020	None	Threatened	G1G2	S2	SSC
Ambystoma californiense pop. 1 California tiger salamander - central California DPS	AAAAA01181	Threatened	Threatened	G2G3T3	S3	WL
Antrozous pallidus pallid bat	AMACC10010	None	None	G4	S3	SSC
Aquila chrysaetos golden eagle	ABNKC22010	None	None	G5	S3	FP
Athene cunicularia burrowing owl	ABNSB10010	None	None	G4	S2	SSC
Buteo swainsoni Swainson's hawk	ABNKC19070	None	Threatened	G5	S4	
Circus hudsonius northern harrier	ABNKC11011	None	None	G5	S3	SSC
Corynorhinus townsendii Townsend's big-eared bat	AMACC08010	None	None	G4	S2	SSC
Delphinium californicum ssp. interius Hospital Canyon larkspur	PDRAN0B0A2	None	None	G3T3	S3	1B.2
Dudleya abramsii ssp. setchellii Santa Clara Valley dudleya	PDCRA040Z0	Endangered	None	G4T2	S2	1B.1
Emys marmorata western pond turtle	ARAAD02030	Proposed Threatened	None	G3G4	S3	SSC
Eryngium aristulatum var. hooveri Hoover's button-celery	PDAPI0Z043	None	None	G5T1	S1	1B.1
Eryngium spinosepalum spiny-sepaled button-celery	PDAPI0Z0Y0	None	None	G2	S2	1B.2
Extriplex joaquinana San Joaquin spearscale	PDCHE041F3	None	None	G2	S2	1B.2
Falco mexicanus prairie falcon	ABNKD06090	None	None	G5	S4	WL
Gonidea angulata western ridged mussel	IMBIV19010	None	None	G3	S2	
Haliaeetus leucocephalus bald eagle	ABNKC10010	Delisted	Endangered	G5	S3	FP

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Lasiurus cinereus hoary bat	AMACC05032	None	None	G3G4	S4	
Lavinia exilicauda harengus Monterey hitch	AFCJB19013	None	None	G4T3	S3	SSC
Leptosyne hamiltonii Mt. Hamilton coreopsis	PDAST2L0C0	None	None	G2	S2	1B.2
Lessingia micradenia var. glabrata smooth lessingia	PDAST5S062	None	None	G2T2	S2	1B.2
Malacothamnus hallii Hall's bush-mallow	PDMAL0Q0F0	None	None	G2	S2	1B.2
Monolopia gracilens woodland woollythreads	PDAST6G010	None	None	G3	S3	1B.2
Navarretia gowenii Lime Ridge navarretia	PDPLM0C120	None	None	G1	S1	1B.1
Navarretia nigelliformis ssp. radians shining navarretia	PDPLM0C0J2	None	None	G4T2	S2	1B.2
Navarretia prostrata prostrate vernal pool navarretia	PDPLM0C0Q0	None	None	G2	S2	1B.2
Oncorhynchus mykiss irideus pop. 9 steelhead - south-central California coast DPS	AFCHA0209H	Threatened	None	G5T2Q	S2	
Perognathus inornatus San Joaquin pocket mouse	AMAFD01060	None	None	G2G3	S2S3	
Phrynosoma blainvillii coast horned lizard	ARACF12100	None	None	G4	S4	SSC
Plagiobothrys glaber hairless popcornflower	PDBOR0V0B0	None	None	GX	SX	1A
Rana boylii pop. 4 foothill yellow-legged frog - central coast DPS	AAABH01054	Threatened	Endangered	G3T2	S2	
Rana draytonii California red-legged frog	AAABH01022	Threatened	None	G2G3	S2S3	SSC
Ravenella exigua chaparral harebell	PDCAM020A0	None	None	G2	S2	1B.2
Spea hammondii western spadefoot	AAABF02020	Proposed Threatened	None	G2G3	S3S4	SSC
Taxidea taxus American badger	AMAJF04010	None	None	G5	S3	SSC
Trifolium hydrophilum saline clover	PDFAB400R5	None	None	G2	S2	1B.2
Vulpes macrotis mutica San Joaquin kit fox	AMAJA03041	Endangered	Threatened	G4T2	S3	

Record Count: 37

CALIFORNIA NATIVE PLANT SOCIETY

CNPS Rare Plant Inventory

Search Results

28 matches found. Click on scientific name for details

Search Criteria: 9-Quad include [**3612184:3612183:3612182:3712113:3712114:3712122:3712112:3712123:3712124**]

▲ SCIENTIFIC NAME	COMMON NAME	FAMILY	LIFEFORM	BLOOMING PERIOD	FED LIST	STATE LIST	CA RARE PLANT RANK	LOWEST ELEVATION (FT)	HIGHEST ELEVATION (FT)	PHOTO
Acanthomintha lanceolata	Santa Clara thorn-mint	Lamiaceae	annual herb	Mar-Jun	None	None	4.2	260	3935	 © 2005 Barry Breckling
Allium howellii var. *howellii*	Howell's onion	Alliaceae	perennial bulbiferous herb	Mar-Apr	None	None	4.3	165	7220	 © 2013 Neal Kramer
Clarkia breweri	Brewer's clarkia	Onagraceae	annual herb	Apr-Jun	None	None	4.2	705	3660	No Photo Available
Clarkia concinna ssp. *automixa*	Santa Clara red ribbons	Onagraceae	annual herb	(Apr)May-Jun(Jul)	None	None	4.3	295	4920	No Photo Available
Convolvulus simulans	small-flowered morning-glory	Convolvulaceae	annual herb	Mar-Jul	None	None	4.2	100	2430	No Photo Available
Cryptantha rattanii	Rattan's cryptantha	Boraginaceae	annual herb	Apr-Jul	None	None	4.3	805	3000	No Photo Available
Delphinium californicum ssp. *interius*	Hospital Canyon larkspur	Ranunculaceae	perennial herb	Apr-Jun	None	None	1B.2	640	3595	No Photo Available
Dudleya abramsii ssp. *setchellii*	Santa Clara Valley dudleya	Crassulaceae	perennial herb	Apr-Oct	FE	None	1B.1	195	1755	No Photo Available
Eryngium aristulatum var. *hooveri*	Hoover's button-celery	Apiaceae	annual/perennial herb	(Jun)Jul(Aug)	None	None	1B.1	10	150	No Photo Available
Eryngium spinosepalum	spiny-sepaled button-celery	Apiaceae	annual/perennial herb	Apr-Jun	None	None	1B.2	260	3200	No Photo Available

Extriplex joaquinana	San Joaquin spearscale	Chenopodiaceae	annual herb	Apr-Oct	None	None	1B.2	5	2740	No Photo Available
Fritillaria agrestis	stinkbells	Liliaceae	perennial bulbiferous herb	Mar-Jun	None	None	4.2	35	5100	 © 2016 Aaron Schusteff
Galium andrewsii ssp. *gatense*	phlox-leaf serpentine bedstraw	Rubiaceae	perennial herb	Apr-Jul	None	None	4.2	490	4755	 © 2021 Steve Matson
Iris longipetala	coast iris	Iridaceae	perennial rhizomatous herb	Mar-May(Jun)	None	None	4.2	0	1970	 © 2014 Aaron Schusteff
Leptosiphon ambiguus	serpentine leptosiphon	Polemoniaceae	annual herb	Mar-Jun	None	None	4.2	395	3710	 © 2010 Aaron Schusteff
Leptosiphon grandiflorus	large-flowered leptosiphon	Polemoniaceae	annual herb	Apr-Aug	None	None	4.2	15	4005	 © 2003 Doreen L. Smith
Leptosyne hamiltonii	Mt. Hamilton coreopsis	Asteraceae	annual herb	Mar-May	None	None	1B.2	1805	4265	 ©2012 Aaron Schusteff
Lessingia micradenia var. *glabrata*	smooth lessingia	Asteraceae	annual herb	(Apr-Jun)Jul-Nov	None	None	1B.2	395	1380	 © 2015 Aaron Schusteff
Lessingia tenuis	spring lessingia	Asteraceae	annual herb	May-Jul	None	None	4.3	985	7055	 © 2020 Keir Morse
Malacothamnus hallii	Hall's bush-mallow	Malvaceae	perennial deciduous shrub	(Apr)May-Sep(Oct)	None	None	1B.2	35	2495	 © 2017 Keir Morse

Monolopia gracilens	woodland woollythreads	Asteraceae	annual herb	(Feb)Mar-Jul	None	None	1B.2	330	3935	 © 2016 Richard Spellenberg
Navarretia gowenii	Lime Ridge navarretia	Polemoniaceae	annual herb	May-Jun	None	None	1B.1	590	1000	No Photo Available
Navarretia nigelliformis ssp. *radians*	shining navarretia	Polemoniaceae	annual herb	(Mar)Apr-Jul	None	None	1B.2	215	3280	No Photo Available
Navarretia prostrata	prostrate vernal pool navarretia	Polemoniaceae	annual herb	Apr-Jul	None	None	1B.2	10	3970	No Photo Available
Piperia michaelii	Michael's rein orchid	Orchidaceae	perennial herb	Apr-Aug	None	None	4.2	10	3000	No Photo Available
Plagiobothrys glaber	hairless popcornflower	Boraginaceae	annual herb	Mar-May	None	None	1A	50	590	No Photo Available
Ravenella exigua	chaparral harebell	Campanulaceae	annual herb	May-Jun	None	None	1B.2	900	4100	No Photo Available
Trifolium hydrophilum	saline clover	Fabaceae	annual herb	Apr-Jun	None	None	1B.2	0	985	 © 2005 Dean Wm Taylor

Showing 1 to 28 of 28 entries

Suggested Citation:

California Native Plant Society, Rare Plant Program. 2024. Rare Plant Inventory (online edition, v9.5). Website https://www.rareplants.cnps.org [accessed 23 January 2024].

Exhibit 1B – Botanical Special-Status Species Assessment



Exhibit 1B - Botanical Special Status Species Assessment

Pacheco Reservoir Expansion Project Design Level Geotechnical Investigations

June 2024

Prepared by:

AECOM

Stantec GEI Consultants

Prepared for:

Valley Water

Valley Water Project Number: 91954002

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Acronyms and Abbreviations

AF	acre-feet
Cal-IPC	California Invasive Plant Council
CDFW	California Department of Fish and Wildlife
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CRPR	California Rare Plant Rank
IPMP	Invasive Plant Management Program
msl	mean sea level
NNIP	Non-Native Invasive Plant
PREP	Pacheco Reservoir Expansion Project
Project	Design Level Geotechnical Investigations
USFWS	United States Fish and Wildlife Service
Valley Water	Santa Clara Valley Water District

Executive Summary

This exhibit to the Biological Resources Assessment Report documents the findings of botanical surveys and nonnative invasive plant mapping performed for the Design Level Geotechnical Investigations (Project) that are proposed in support of the Pacheco Reservoir Expansion Project. The botanical surveys were floristic in nature and conducted over the course of six botanical survey periods in 2020 and 2023, and two special-status plant species comprised of two populations were identified in the 55-acre study area. Nonnative invasive plant mapping was also performed during the focused botanical survey efforts and resulted in the identification of four different species totaling six populations in the study area.

Chapter 1. Introduction

This exhibit to the Biological Resources Assessment Report was prepared for Santa Clara Valley Water District (Valley Water) in support of the Design Level Geotechnical Investigations (Project) that are proposed in support of the Pacheco Reservoir Expansion Project (PREP) and documents the findings of the botanical surveys, and nonnative invasive plant (NNIP) species mapping within the Project study area. The purpose of this document is to provide sufficient detail to support the development of Project environmental documents and permits. The results of the botanical surveys have been used to develop the discussion of Project impacts on special status species.

PREP is a multi-agency effort to provide water supply reliability, environmental restoration, and other benefits through the construction of new facilities and long-term operation strategies and would include expanding the storage capacity of the existing Pacheco Reservoir to up to approximately 140,000 acre-feet (AF) through construction of a new dam, conveyance facilities, and appurtenant infrastructure.

Chapter 2. Methods

2.1 Reference Review

2.1.1 Botanical Surveys

A list of potentially occurring special-status plant species in the study area was created using a combination of database searches, a review of existing information, and the vegetation community information from the *Terrestrial Vegetation Community Mapping TM* prepared for the larger PREP planning process. For the purposes of this exhibit, special-status plant species include the following: species listed in the most current California Department of Fish and Wildlife (CDFW) *Special Vascular Plants, Bryophytes, and Lichens List* (CDFW 2023a): plants listed, proposed for listing, or are a candidate for listing under the California Endangered Species Act or the federal Endangered Species Act; designated as rare by CDFW; or listed as a California Rare Plant Rank (CRPR) 1, 2, 3, or 4 species.

The following databases were used to create the list of special-status plant species with potential to occur: the California Natural Diversity Database (CNDDB); the California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants; and the Official Species List generated by the United States Fish and Wildlife Service (USFWS) Information, Planning, and Conservation project planning tool (CDFW 2023b; CNPS 2023; USFWS 2023a).

The CNDDB was queried for reported populations of special-status plants and sensitive natural communities within the *Three Sisters, San Felipe, Mustang Peak, and Pacheco Peak California* U.S. Geological Survey 7.5-minute topographic quadrangles and the quadrangles immediately adjacent (i.e., reviewed 18 quadrangles total) (CDFW 2023b). The CNDDB is a database consisting of historical observations of special-status plant species, special-status wildlife species, and sensitive natural plant communities. Because the CNDDB is limited to reported sightings, it is not a comprehensive list of species that may occur in an area.

The CNPS online Inventory of Rare and Endangered Plants of California was also queried, which allows users to search the inventory using a set of criteria (e.g., location, habitat, elevation) (CNPS 2023). The CNPS inventory was queried for all CRPR 1, 2, 3, and 4 plants occurring in the same topographic quadrangles included in the CNDDB query. All CRPR 1, 2, 3, and 4 plant species were included in the queries to evaluate whether any of these plant species have the potential to occur in the study area.

The Official Species List generated from the USFWS Information, Planning, and Conservation online project planning tool—which identifies federally listed, proposed, and candidate species, as well as critical habitat that may occur in the study area—was also reviewed during the development of the special-status plant species list. The Official Species List generated by the USFWS Information, Planning, and Conservation online tool is a comprehensive list of regionally occurring federally protected species and their critical habitat provided by the USFWS for purposes of consultation, which uses project-specific boundaries to generate the list of species and their critical habitat.

Soil types mapped in the study area were also reviewed to determine if any soils are known to occur that may provide suitable habitat for special-status plant species, such as serpentine or limestone (Natural Resources Conservation Service 2023). The Consortium of California Herbaria and Calflora were queried for specimen records, photographs, and habitat descriptions

to better identify potential special-status species and their habitat (Consortium of California Herbaria 2020; Calflora 2023).

2.2 Field Surveys

2.2.1 Botanical Surveys

2.2.1.1 Special-Status Species Reference Population Visits

Stantec botanists visited nearby reference populations for 36 special-status plant species with potential to occur within the study area to determine if the plants were in bloom or were otherwise identifiable at the time of the survey. These visits also provided the field team an opportunity to refine their search images for specific taxa. Stantec queried the CNDDB to identify nearby reference populations, and field surveys took place in 2020 between mid-March and mid-August and in 2023 between May and August. Special-status plant species with nearby reference populations, including information as to whether they were found, are provided in Table 2-1.

Table 2-1. Visited Special-Status Plant Species Reference Populations

Special-Status Species Scientific Name (Common Name)	Status[1] Federal/State/CRPR	2020 Surveys		2023 Surveys	
		Number of Visits to Reference Sites	Reference Population Found (Y/N)	Number of Visits to Reference Sites	Reference Population Found (Y/N)
Acanthomintha lanceolata (Santa Clara thorn-mint)	–/–/4.2	1	Y	2	Y
Allium howellii var. *howellii* (Howell's onion)	–/–/4.3	-	-	1	Y
Astragalus tener var. *tener* (Alkali milk-vetch)	–/–/1B.2	1	N	-	-
Balsamorhiza macrolepis (Big-scale balsamroot)	–/–/1B.2	2	Y	-	-
Campanula exigua (chaparral harebell)	–/–/1B.2	-	-	2	N
Centromadia parryi ssp. *rudis* (pappose tarweed)	–/–/4.2	-	-	1	Y
Ceanothus ferrisiae (coyote ceanothus)	E/–/1B.2	1	Y	-	-
Clarkia breweri (Brewer's clarkia)	–/–/4.2	1	Y	2	Y
Clarkia concinna ssp. *automixa* (Santa Clara red ribbons)	–/–/4.2	1	Y	1	N
Cryptantha rattanii (Rattan's cryptantha)	–/–/4.3	-	-	1	N
Delphinium californicum ssp. *interius* (Hospital Canyon larkspur)	–/–/1B.2	1	Y	1	Y
Dudleya abramsii ssp. *setchellii* (Santa Clara Valley dudleya)	E/–/1B.1	-	-	2	Y
Eryngium spinosepalum (spiny-sepaled button-celery)	–/–/1B.2	1	Y	-	-
Extriplex joaquinana (San Joaquin spearscale)	–/–/1B.2	1	Y	2	Y

Special-Status Species Scientific Name (Common Name)	Status[1] Federal/State/CRPR	2020 Surveys		2023 Surveys	
		Number of Visits to Reference Sites	Reference Population Found (Y/N)	Number of Visits to Reference Sites	Reference Population Found (Y/N)
Fritillaria agrestis (stinkbells)	–/–/4.2	1	N	1	Y
Fritillaria liliacea (fragrant fritillary)	–/–/1B.2	2	Y	-	-
Gallium andrewsii ssp. *gatense* (phlox-leaved serpentine bedstraw)	–/–/4.2	-	-	2	Y
Hoita strobilina (Loma Prieta hoita)	–/–/1B.1	1	Y	-	-
Iris longipetala (Coastal iris)	–/–/4.2	1	Y	-	-
Lasthenia ferrisiae (Ferris' goldfields)	–/–/4.2	-	-	1	Y
Leptosiphon ambiguus (serpentine leptosiphon)	–/–/4.2	-	-	2	Y
Leptosiphon grandiflorus (large flowered leptosiphon)	–/–/4.2	-	-	1	Y
Leptosyne hamiltonii (Mt. Hamilton coreopsis)	–/–/1B.2	-	-	1	N
Lessingia hololeuca (woolly-headed lessingia)	–/–/3	1	Y	-	-
Lessingia micradenia var. *glabrata* (smooth lessingia)	–/–/1B.2	-	-	1	Y
Lessingia tenuis (spring lessingia)	–/–/4.3	1	Y		
Malacothamnus aboriginum (Indian Valley bush-mallow)	–/–/1B.2	-	-	2	Y
Monolopia gracilens (woodland woolythreads)	--/--/2B.3	2	Y	2	Y
Navarretia gowenii (Lime Ridge navarretia)	–/–/1B.1	-	-	-	-
Phacelia phacelioides (Mt. Diablo phacelia)	–/–/1B.2	-	-	1	N
Piperia michaelii (Michael's rein orchid)	–/–/4.2	1	N	-	-
Puccinellia simplex (California alkali grass)	–/–/1B.2	1	N	-	-
Streptanthus callistus (Mt. Hamilton jewelflower)	–/–/1B.3	-	-	1	N
Streptanthus glandulosus ssp. *glandulosus* (most beautiful jewelflower)	–/–/1B.2	-	-	2	Y
Streptanthus insignis ssp. *insignis* (Plumed jewelflower)	–/–/4.3	-	-	1	N
Streptanthus insignis ssp. *lyonii* (Arburua Ranch jewelflower)	–/–/1B.2	-	-	1	N

Notes:
[1] Federal: T = Threatened
California Rare Plant Rank (CRPR) Codes and Extensions:
1B = Plants rare, threatened, or endangered in California and elsewhere.
2B = Plants rare, threatened, or endangered in California but more common elsewhere
3 = Review list: Plants about which more information is needed
4 = Limited distribution or infrequent throughout a broader area in California

XX.1 Seriously threatened in California
XX.2 Moderately threatened in California
XX.3 Not very threatened in California

2.2.1.2 Botanical Field Surveys

Stantec botanists conducted botanical surveys in accordance with the CDFW Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities and the CNPS Botanical Survey Guidelines (CDFW 2018; CNPS 2001). The surveys were floristic in nature (i.e., each species observed was identified to the taxonomic level necessary to determine whether the plant was listed as a special-status or a NNIP species) and plant taxonomy followed the treatments and keys provided in the Jepson Flora Project (2023). The timing of the botanical field surveys coincided with the blooming period(s) for the special-status plant species with potential to occur in the study area and provided a comprehensive survey effort for special-status plant species within the study area. The terrestrial vegetation community types identified in the PREP *Terrestrial Vegetation Community Mapping Technical Memorandum* prepared for the Project were also used to concentrate survey efforts: for example, transects were spaced closer in vegetation communities with higher potential for the target special-status plant species to occur. Stantec botanists used ESRI's Collector for ArcGIS application on tablets and phones to collect plant population data in the field.

Stantec botanists conducted three survey passes of the PREP study area, each of which consisted of walking meandering transects that covered the accessible portions of the study area. The portion of the PREP study area within Henry Coe State Park was inaccessible and was not included in the survey efforts and totaled approximately 105 acres (i.e., less than 2 percent of the study area was inaccessible during the surveys). Other inaccessible areas include those that were restricted by landowners or those that were too steep or otherwise unsafe to access. Areas that were unsafe or restricted were scanned using binoculars. Three rounds of survey passes were completed to observe early-, mid-, and late-season blooming plants between March 16 to April 6, 2020, May 4 to May 22, 2020, and July 20 to August 14, 2020. Additional rounds of surveys were completed between May 9 and 15, June 5 and 21, July 31, and August 4 and 7, 2023. A total of 4,300 person hours were spent during field surveys between all rounds of surveys.

Depending on species abundance and density, individuals or populations of special-status plant species were mapped and then later grouped into CNDDB element occurrences using the CNDDB 0.25-mi distance as general guidance. In locations with high density of a special-status plant species, the number of individuals of each special-status plant species were estimated using square meter plot sampling method, which included using multiple quadrats, and were extrapolated for the overall area where the species were found. Multiple quadrats were established to reflect the variations in the density and distribution of each of the special-status plant populations.

2.2.2 Non-Native Invasive Plants

Species considered NNIP species (i.e., noxious weeds), were identified as those included in the California Invasive Plant Council (Cal-IPC) inventory with ratings of High or are included in Valley Waters' Invasive Plant Management Program (IPMP) (Cal-IPC 2023, Valley Water 2019). Stantec botanists mapped all observed NNIP populations within the study area. This included taking point or polygon data of invasive plant populations and collecting site-specific information, including phenology, photo documentation, and distribution pattern.

Chapter 3. Results and Discussion

3.1 Botanical Surveys

The reference review identified 25 special-status plant species with potential to occur in the study area. During surveys for PREP, which includes the study area, a total of 604 different plant taxa were identified, and 2 of those species considered to have a special-status were detected within the study area. A complete list of plant species observed for PREP is provided in Sub-exhibit 1B1.

The two special-status plant species were documented in the study area during the survey efforts include Hall's bush-mallow (*Malacothamnus arcuatus* var. *elmeri* [syn. *M. hallii*]) and woodland woolythreads (*Monolopia gracilens*), which are described below. Figure 3-1 illustrates an overview of the study area, while Figures 3-1a-d illustrate present a detailed view of the study area. Sub-exhibit 1B2 includes representative photographs of these species documented in the vicinity of the study area. Note that the figures also provide the locations of narrowleaf milkweed (*Asclepias fascicularis*), because it is the host plant of the monarch butterfly (*Danaus plexippus*), which is currently a federal candidate species. Areas of purple needlegrass (*Stipa pulchra*) are also included in the figures, because populations of this species at sufficient absolute cover are considered a sensitive natural community by CDFW. In total, two occurrences of the two special-status plant species (one occurrence of each species) were observed in the study area during the botanical surveys. Because these two species were detected within the study area during surveys for PREP in 2020, CNDDB forms were filled-out and submitted to CDFW at the end of the 2020 survey season.

3.1.1 Species Accounts

3.1.1.1 Hall's Bush-Mallow

Hall's bush-mallow is a CRPR 1B.2 species. Hall’s bush-mallow is an evergreen shrub in the mallow family (*Malvaceae*) that grows in chaparral and coastal scrub habitats. It occurs in California in Alameda, Contra Costa, Mendocino, Merced, Santa Clara, San Mateo, and Stanislaus Counties. Hall’s bush-mallow usually flowers from April to September and occurs at elevations between 30 and 2,495 feet msl. This species was observed in California sagebrush associated habitats, in the upstream portion of the study area, with the highest concentration in the areas just southeast of the North Fork Dam and north of SR-152. One occurrence of approximately 95 individual plants were observed during the survey efforts.

3.1.1.2 Woodland Woolythreads

Woodland woolythreads is a CRPR 1B.2 species. Woodland woolythreads is an annual herb in the daisy family (*Asteraceae*) that grows in openings in broadleafed upland forest, chaparral, cismontane woodland, North Coast coniferous forest, and valley and foothill grassland habitats. Occasionally, it is found on serpentine soils. It occurs in California in Alameda, Contra Costa, Monterey, San Luis Obispo, Santa Clara, Santa Cruz, and San Mateo Counties. Woodland woolythreads usually flowers from March to July and occurs at elevations between 325 and 3,935 feet msl. This species was observed primarily on south facing slopes on steep hillsides, in the watersheds of the East Fork and North Fork Pacheco Creek. One occurrence and approximately 61 individual plants were observed during the survey efforts.

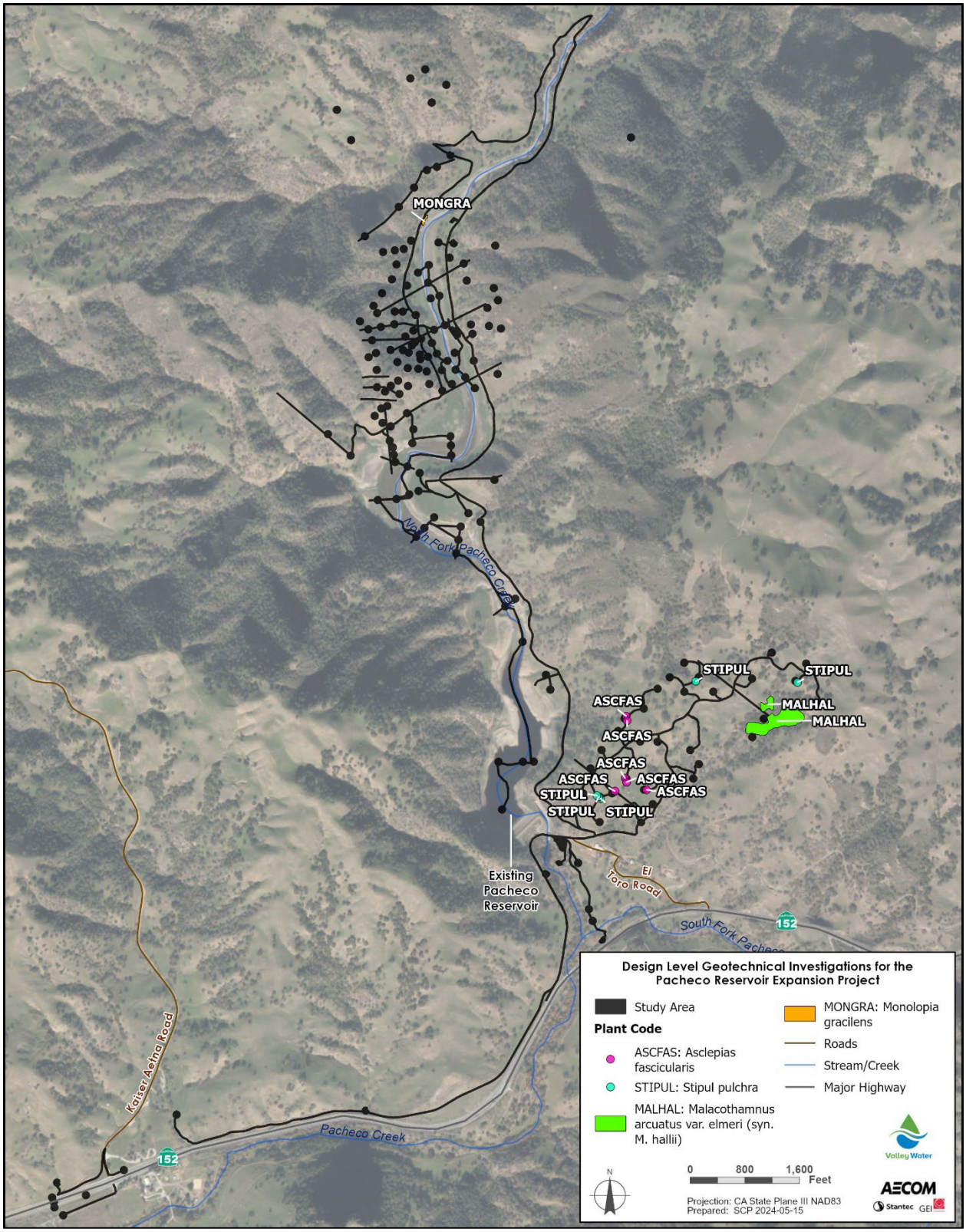

Figure 3-1. Special-Status Plant Species Study Area Overview

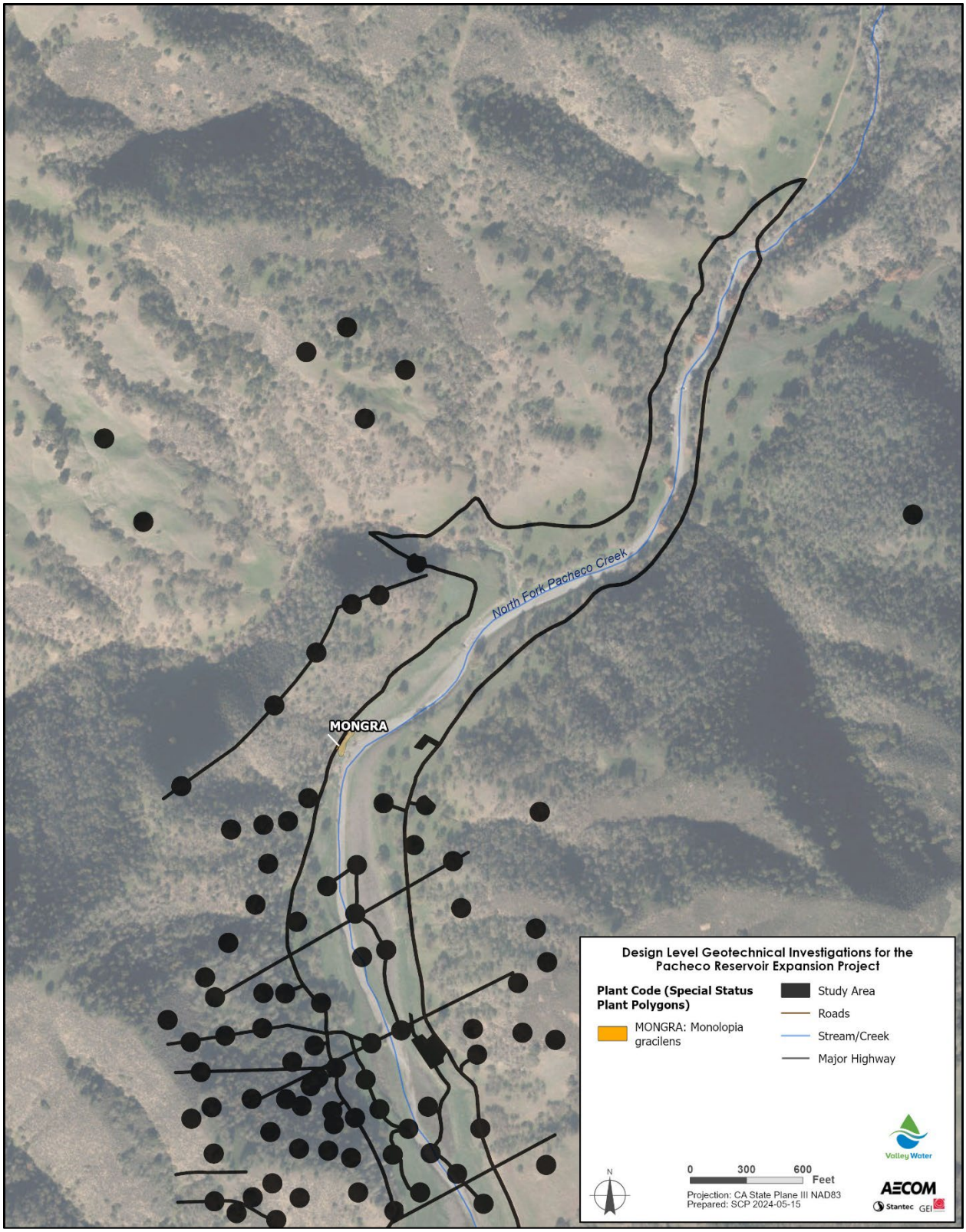

Figure 3-2a. Special-Status Plant Species Northern Detail Map 1 of 4

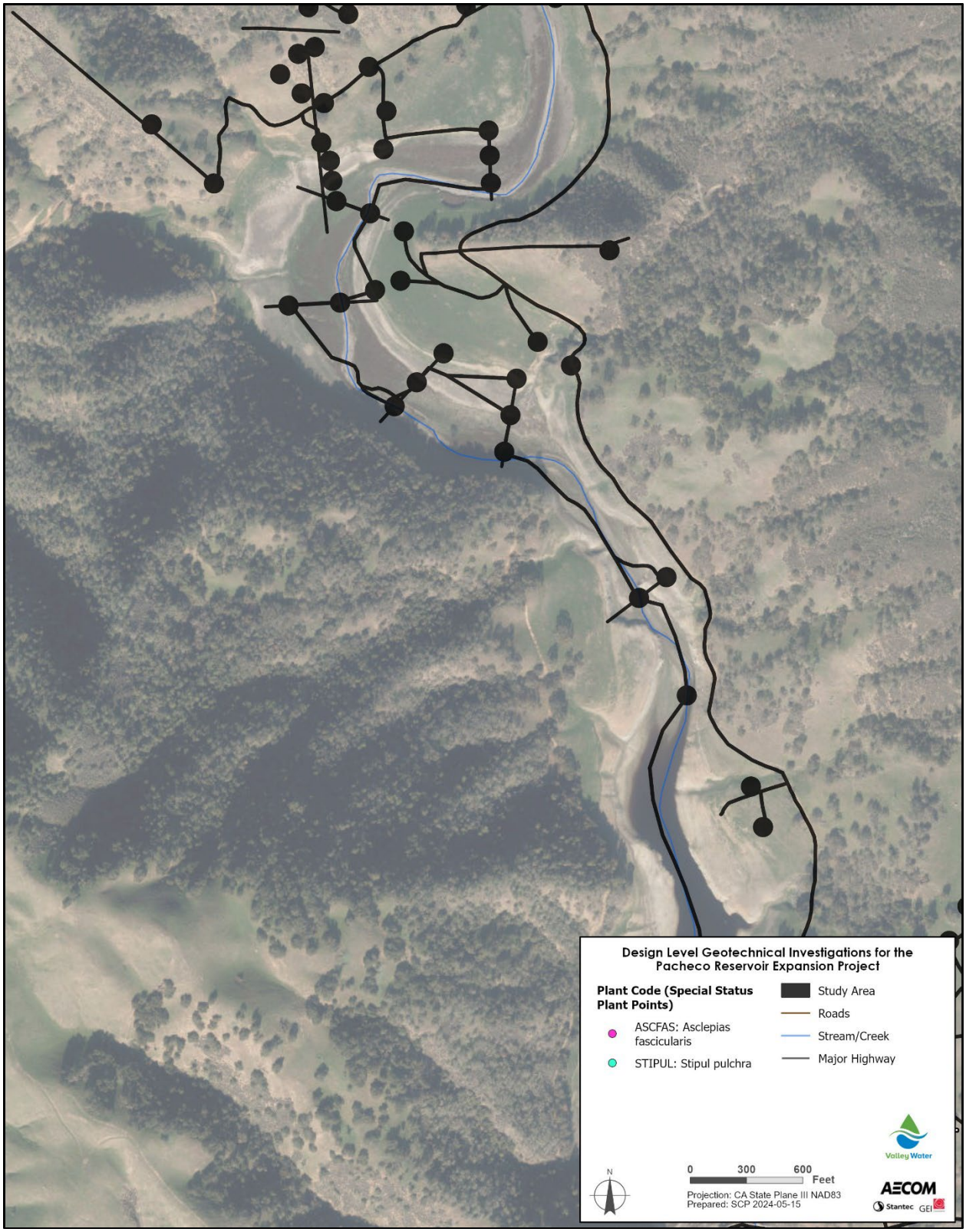

Figure 3-2b. Special-Status Plant Species Northern Detail Map 2 of 4

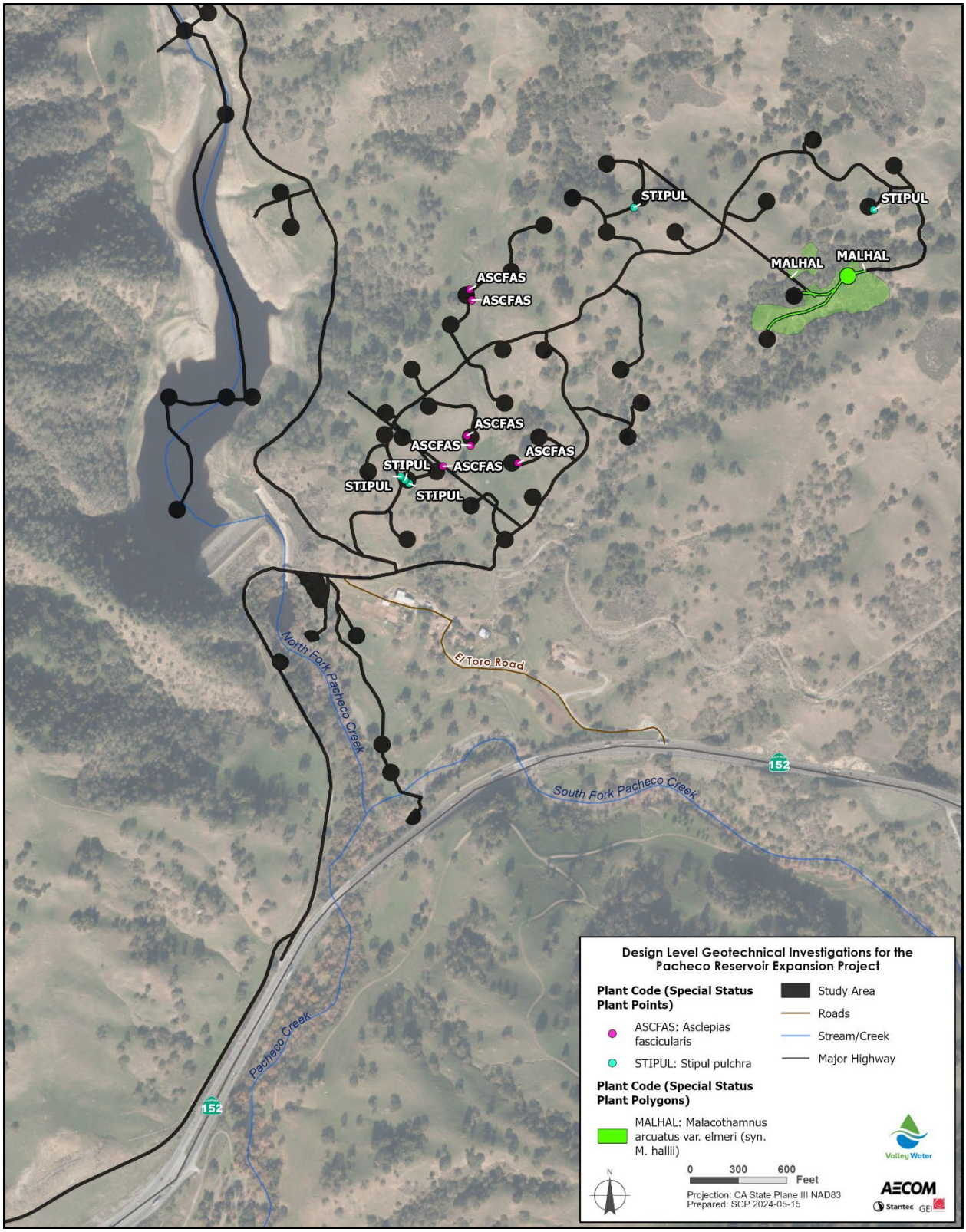

Figure 3-2c. Special-Status Plant Species Northern Detail Map 3 of 4

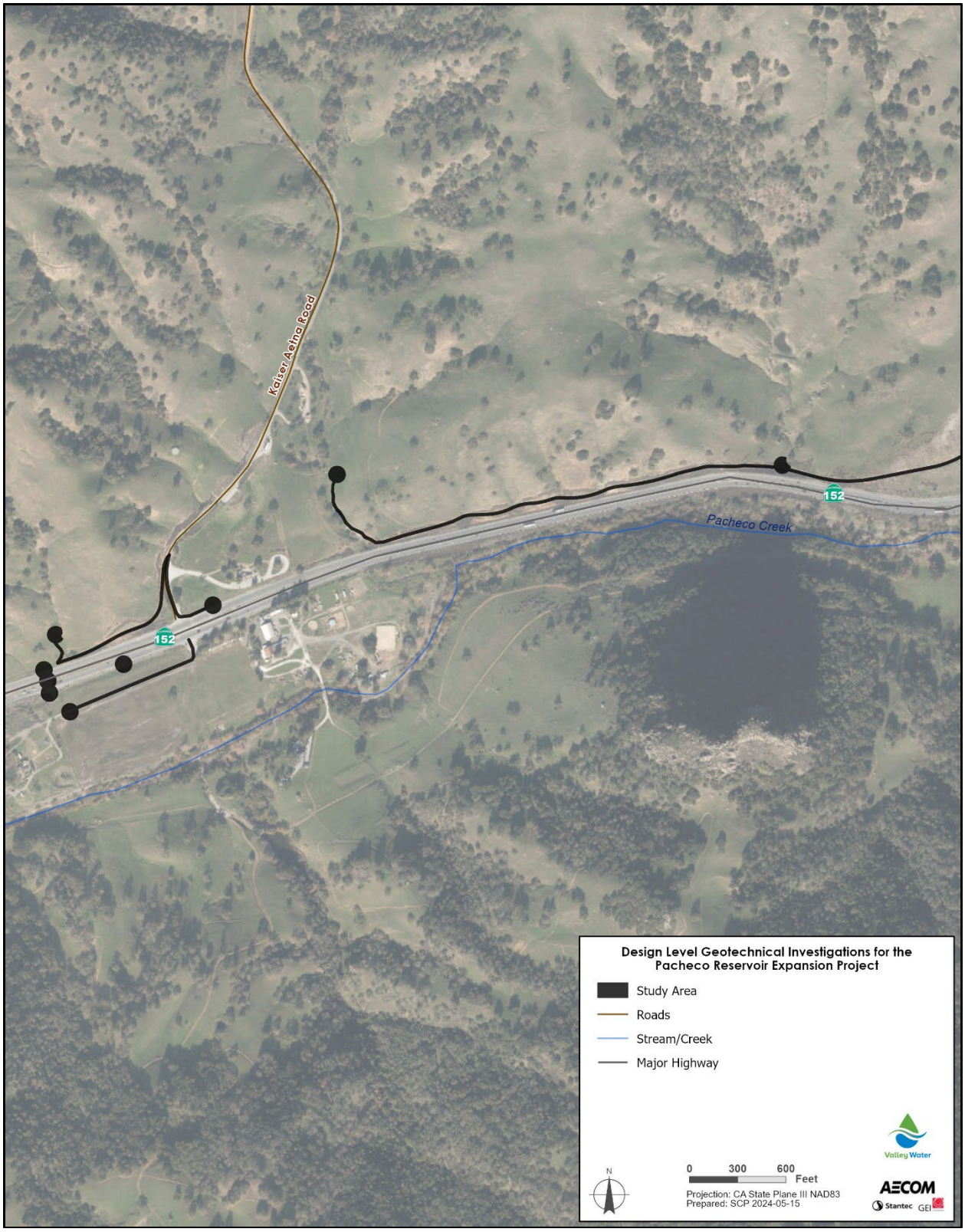

Figure 3-2d. Special-Status Plant Species Northern Detail Map 4 of 4

3.2 Non-Native Invasive Plants

The NNIP mapping during the botanical survey efforts documented four different NNIP species in in the study area; a total of six occurrences. Table 3-1 lists the four NNIP species observed in the study area, and Figure 3-3 illustrates the locations where they were observed. Major concentrations of NNIP were found along the North Fork Pacheco Creek and the grassland area used for livestock southeast of the reservoir. Three of the species were included on the list based on their CaL-IPC “high” listing. Three of the species are also considered to be a NNIP species by Valley Water (Valley Water 2019).

Table 3-1. Non-Native Invasive Plant Species List

Family	Scientific Name	Common Name	CAL-IPC Status*	IPMP*	Number of Occurrences
Apiaceae	*Foeniculum vulgare*	Fennel	H	x	1
Asteraceae	*Centaurea solstitialis*	Yellow starthistle	H	x	2
Asteraceae	*Dittrichia graveolens*	Stinkwort	M	x	1
Poaceae	*Bromus madritensis ssp. rubens*	Foxtail brome	H		2
				Total	**6**

Notes: *W = Watch, L = Limited, M=Moderate, H=High; Valley Water IPMP = Santa Clara Valley Water District Invasive Plant Management Plan.

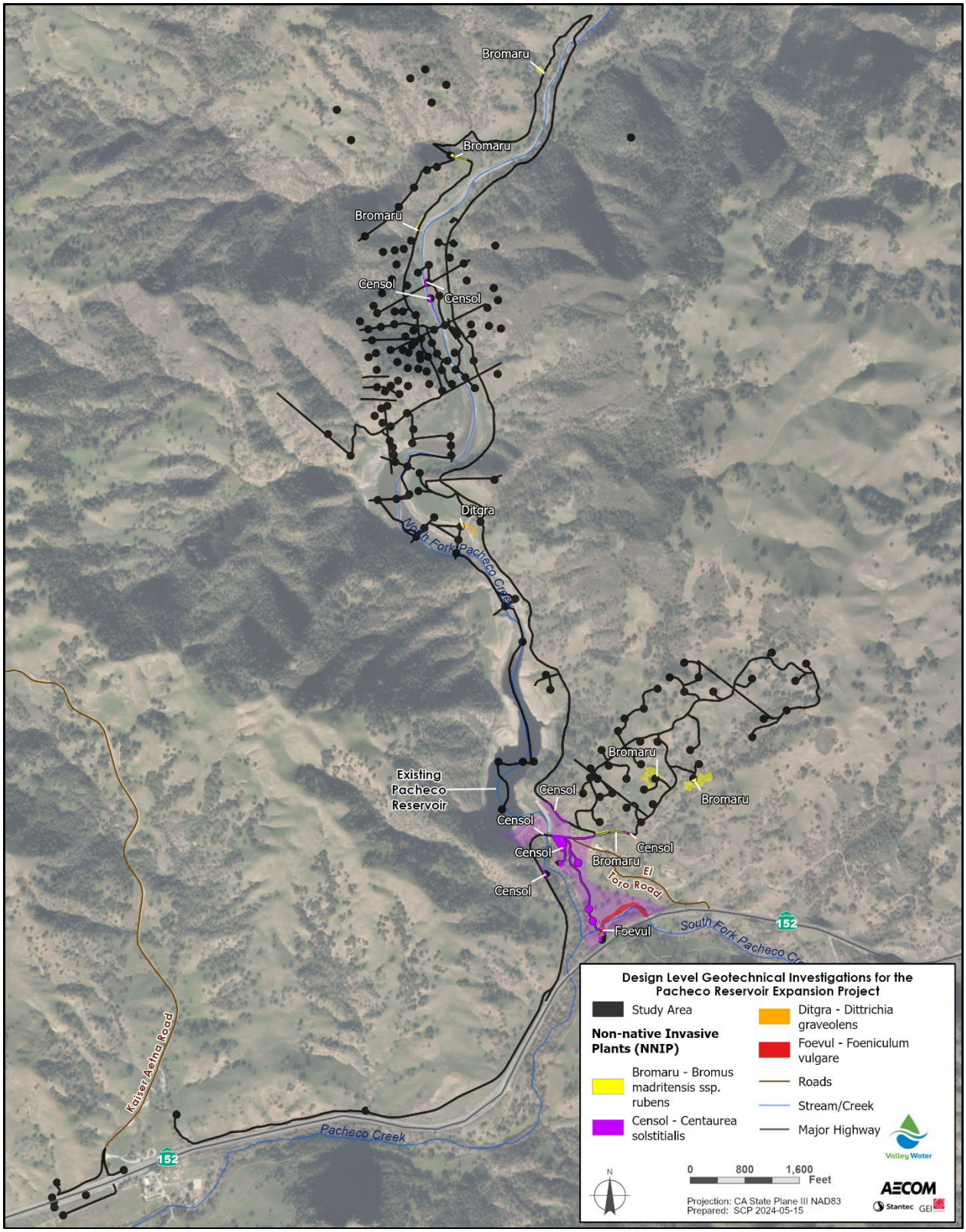

Figure 3-3. NNIP Populations Upstream of North Fork Dam

Chapter 4. References

Calflora (California Flora Nursery). 2023. Information on California plants for education, research and conservation, with data contributed by public and private institutions and individuals, including the Consortium of California Herbaria. [Internet]. Berkeley, California: The Calflora Database [a non-profit organization]. Available at: http://www.calflora.org/. Accessed August 2023.

CDFW (California Department of Fish and Wildlife). 2018. *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities*. California Natural Resources Agency Department of Fish and Wildlife.

_____. 2023a. Special vascular plants, bryophytes, and lichens list. California Department of Fish and Wildlife, Natural Diversity Database. Periodic publication. List updated August 2020. Available at: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=109383&inline. Accessed September 2023.

_____. 2023b. California Natural Diversity Database. RareFind 5 [Internet]. California Department of Fish and Wildlife, Sacramento, California. Available at: https://www.wildlife.ca.gov/Data/CNDDB/Maps-and-Data. Accessed September 2023.

(Cal-IPC) California Invasive Plant Council. 2023. The Cal-IPC Inventory. Available at: https://www.cal-ipc.org/plants/inventory/. Accessed September 2023.

CNPS (California Native Plant Society). 2001. CNPS Botanical Survey Guidelines. California Native Plant Society, Sacramento, California.

_____. 2023. Inventory of rare and endangered plants of California (online edition, v8-03 0.39). Available at: http://www.rareplants.cnps.org/. Accessed September 2023.

Jepson Flora Project. 2023. Jepson eFlora. Available at: http://ucjeps.berkeley.edu/eflora/. Accessed August 2023.

Natural Resources Conservation Service. 2023. Web Soil Survey. Available at: http://websoilsurvey.nrcs.usda.gov. Accessed August 2023.

USFWS (U.S. Fish and Wildlife Service). 2023. Environmental Conservation Online System, Information for Planning and Consultation [Online]. Available at: https://ecos.fws.gov/ipac/. Accessed September 2023.

Valley Water (Santa Clara Valley Water District). 2019. *Fact Sheet: Invasive Plant Management Program.*

_____2023. Pacheco Reservoir Expansion Project Alternative Terrestrial Habitat Mapping Technical Memorandum.

Sub-exhibit 1B1– Plant Species Observed[1]

[1] Plant list includes all species observed during PREP botanical surveys, which includes all the species observed within the study area.

Scientific Name	Common Name	habit	Status[1]	2020-2022	2023
Agavaceae (Agave Family)					
Chlorogalum pomeridianum var. *pomeridianum*	common soaproot	perennial herb	native	x	x
Alismataceae (Water-Plantain Family)					
Alisma triviale	Northern water plantain	aquatic perennial herb	native	x	
Echinodorus berteroi	burhead	aquatic perennial herb	native	x	
Alliaceae (Onion Family)					
Allium peninsulare var. *peninsulare*	Mexicali onion	perennial bulbiferous herb	native	x	x
Amaranthaceae (Amaranth Family)					
Amaranthus albus	tumbleweed	annual herb	non-native	x	x
Amaranthus retroflexus	rough pigweed	annual herb	non-native	x	
Anacardiaceae (Sumac Family)					
Malosma laurina	laurel sumac	evergreen tree, shrub	native	x	
Rhus ovata	sugar bush	evergreen shrub	native	x	x
Schinus molle	Peruvian pepper tree	evergreen tree	invasive (Cal-IPC L, SCVWD)	x	x
Toxicodendron diversilobum	poison oak	deciduous vine, shrub	native	x	x
Apiaceae (Carrot Family)					
Anthriscus caucalis	bur chervil	annual herb, vine	non-native		x
Bowlesia incana	bowlesia	annual herb	native	x	x
Conium maculatum	poison hemlock	perennial herb	invasive (Cal-IPC M, SCVWD)	x	x
Daucus pusillus	wild carrot	annual herb	native	x	x
Eryngium aristulatum var. *hooveri*	Hoover's button celery	annual, perennial herb	**rare** (CRPR 1B.1)	x	
Eryngium spinosepalum	spiny sepaled button celery	annual, perennial herb	**rare** (CRPR 1B.2)	x	x
Foeniculum vulgare	fennel	perennial herb	invasive (Cal-IPC H, SCVWD)	x	x
Lomatium californicum	celery weed	perennial herb	native	x	x
Lomatium caruifolium var. *caruifolium*	caraway leaved lomatium	perennial herb	native	x	x

Scientific Name	Common Name	habit	Status[1]	2020-2022	2023
Lomatium dasycarpum	lace parsnip	perennial herb	native	x	x
Lomatium utriculatum	hog fennel	perennial herb	native	x	x
Perideridia californica	California yampah	perennial herb	native	x	x
Perideridia kelloggii	yampah	perennial herb	native	x	
Sanicula bipinnata	poison sanicle	perennial herb	native	x	x
Sanicula bipinnatifida	purple sanicle	perennial herb	native	x	x
Sanicula crassicaulis	Pacific sanicle	perennial herb	native	x	x
Sanicula tuberosa	turkey pea	perennial herb	native	x	x
Scandix pecten-veneris	shepherd's needle	annual herb, vine	non-native	x	x
Tauschia hartwegii	Hartweg's umbrellawort	perennial herb	native		x
Torilis arvensis	field hedge parsley	annual herb	invasive (Cal-IPC H, SCVWD)	x	x
Apocynaceae (Dogbane Family)					
Apocynum cannabinum	hemp dogbane	perennial herb	native	x	
Asclepias fascicularis	narrow leaf milkweed	perennial herb	native	x	x
Nerium oleander	oleander	evergreen tree	invasive	x	x
Vinca major	vinca	perennial herb	invasive (Cal-IPC M, SCVWD)	x	
Araceae (Arum Family)					
Lemna minuta	least duckweed	perennial herb	native	x	x
Asteraceae (Sunflower Family)					
Achillea millefolium	yarrow	perennial herb	native	x	x
Achyrachaena mollis	blow wives	annual herb	native	x	x
Agoseris grandiflora	giant mountain dandelion	perennial herb	native		x
Agoseris heterophylla var. *cryptopleura*	mountain dandelion	annual herb	native		x
Ambrosia psilostachya	ragweed	perennial herb	native	x	
Anaphalis margaritacea	pearly everlasting	perennial herb	native	x	x
Anthemis cotula	dog fennel	annual herb	invasive	x	
Artemisia californica	coastal sage brush	drought-deciduous shrub	native	x	x
Artemisia douglasiana	California mugwort	perennial herb	native	x	x
Baccharis pilularis ssp. *consanguinea*	coyote brush	Evergreen shrub	native	x	x

Scientific Name	Common Name	habit	Status[1]	2020-2022	2023
Baccharis salicifolia ssp. *salicifolia*	mule fat	deciduous shrub	native	x	x
Brickellia californica	California brickellia	perennial herb	native	x	
Calendula arvensis	field marigold	annual herb	non-native	x	
Carduus pycnocephalus ssp. *pycnocephalus*	Italian thistle	annual herb	non-native	x	x
Carduus tenuiflorus	slender flowered thistle	annual herb	invasive		x
Centaurea calcitrapa	purple star thistle	annual, perennial herb	invasive (Cal-IPC M)	x	x
Centaurea cyanus	bachelor's button	annual herb	non-native	x	
Centaurea melitensis	tocalote	annual herb	invasive (Cal-IPC M)	x	x
Centaurea solstitialis	yellow starthistle	annual herb	invasive (Cal-IPC H, SCVWD)	x	x
Centromadia fitchii	spikeweed	annual herb	native	x	x
Centromadia parryi ssp. *rudis*	pappose tarweed	annual herb	**rare** (CRPR 4.2)	x	x
Centromadia pungens ssp. *pungens*	common tarweed	annual herb	native	x	x
Chaenactis glabriuscula	common yellow chaenactis	annual herb	native	x	
Chamaemelum fuscatum	dusky dog fennel	annual herb	non-native		x
Cichorium intybus	chicory	perennial herb	non-native	x	
Cirsium cymosum var. *cymosum*	peregrine thistle	perennial herb	native	x	x
Cirsium occidentale var. *lucianum*	Western thistle	perennial herb	native	x	x
Cirsium vulgare	bullthistle	perennial herb	invasive (Cal-IPC M)	x	x
Corethrogyne filaginifolia	common sandaster	perennial herb	native	x	x
Cotula australis	brass buttons	annual herb	non-native	x	
Cotula coronopifolia	brass buttons	perennial herb	invasive (Cal-IPC L)	x	
Crepis capillaris	smooth hawksbeard	annual, perennial herb	non-native	x	x
Crepis vesicaria ssp. *taraxacifolia*	weedy hawksbeard	annual, perennial herb	non-native	x	x
Cynara cardunculus ssp. *cardunculus*	artichoke	perennial herb	invasive (Cal-IPC M, SCVWD)	x	
Deinandra kelloggii	Kellogg's tarweed	annual herb	native	x	

Scientific Name	Common Name	habit	Status[1]	2020-2022	2023
Dittrichia graveolens	stinkwort	annual herb	invasive (Cal-IPC M, SCVWD)	x	x
Ericameria linearifolia	interior goldenbush	drought-deciduous shrub	native	x	x
Erigeron bonariensis	flax-leaved horseweed	annual herb	non-native	x	
Erigeron canadensis	Canada horseweed	annual herb	native	x	x
Erigeron petrophilus var. *petrophilus*	cliff fleabane	perennial herb	native	x	
Eriophyllum confertiflorum	yellow yarrow	drought-deciduous shrub	native	x	x
Euthamia occidentalis	Western goldenrod	perennial herb	native	x	
Gnaphalium palustre	lowland cudweed	annual herb	native	x	
Grindelia camporum	gumweed	perennial herb	native	x	x
Helenium puberulum	sneezeweed	perennial herb	native	x	
Helianthus annuus	hairy leaved sunflower	annual herb	native	x	x
Helianthus californicus	California sunflower	perennial herb	native	x	x
Helminthotheca echioides	bristly ox-tongue	annual, perennial herb	invasive (Cal-IPC L)	x	x
Hemizonia congesta ssp. *luzulifolia*	woodrush tarweed	annual herb	native	x	x
Hesperevax sparsiflora	few flowered evax	annual herb	native		x
Heterotheca oregona var. *rudis*	red Oregon goldenaster	perennial herb	native	x	
Heterotheca sessiliflora ssp. *echioides*	bristly goldenaster	perennial herb	native	x	
Holocarpha heermannii	Heermann's tarweed	annual herb	native		x
Holocarpha virgata ssp. *virgata*	narrow tarplant	annual herb	native	x	
Holozonia filipes	holozonia	perennial herb	native	x	
Hypochaeris glabra	smooth cat's-ear	annual herb	invasive (Cal-IPC L)	x	x
Lactuca saligna	narrow leaved wild lettuce	annual herb	invasive		x
Lactuca serriola	prickly lettuce	annual herb	invasive	x	x
Lagophylla ramosissima	common hareleaf	annual herb	native	x	x
Lasthenia californica ssp. *californica*	California goldfields	annual herb	native	x	x
Lasthenia glaberrima	smooth goldfields	annual herb	native	x	
Lasthenia glabrata	yellow rayed goldfields	annual herb	native		x

Scientific Name	Common Name	habit	Status[1]	2020-2022	2023
Lasthenia microglossa	small rayed goldfields	annual herb	native		x
Layia pentachaeta ssp. *pentachaeta*	Sierra tidy tips	annual herb	native	x	
Logfia filaginoides	California cottonrose	annual herb	native		x
Logfia gallica	narrowleaf cottonrose	annual herb	non-native	x	x
Madia elegans	common madia	annual herb	native	x	
Madia gracilis	gumweed	annual herb	native	x	x
Matricaria discoidea	pineapple weed	annual herb	native	x	x
Micropus californicus var. *californicus*	slender cottonweed	annual herb	native	x	x
Microseris acuminata	Sierra foothills microseris	annual herb	native		x
Microseris douglasii	Douglas' silverpuffs	annual herb	native		x
Microseris sylvatica	sylvan scorzonella	perennial herb	**rare** (CRPR 4.2)		x
Monolopia gracilens	woodland monolopia	annual herb	**rare** (CRPR 1B.2)	x	
Packera breweri	Brewer's ragwort	perennial herb	native	x	x
Pentachaeta alsinoides	tiny pygmy daisy	annual herb	native		x
Pseudognaphalium californicum	ladies' tobacco	annual, perennial herb	native		x
Pseudognaphalium luteoalbum	Jersey cudweed	annual herb	non-native	x	
Psilocarphus brevissimus	woolly marbles	annual herb	native	x	x
Psilocarphus tenellus	slender woolly heads	annual herb	native	x	x
Rafinesquia californica	California chicory	annual herb	native	x	x
*Rhaponticum repens (*syn. *Acroptilon repens)*	Russian knapweed	perennial herb	invasive (Cal-IPC M)	x	
Senecio aphanactis	California groundsel	annual herb	**rare** (CRPR 2B.2)		x
Senecio californicus	California butterweed	annual herb	native	x	x
Senecio flaccidus var. *douglasii*	bush groundsel	evergreen shrub	native		x
Senecio vulgaris	common groundsel	annual herb	non-native	x	x
Silybum marianum	milk thistle	annual, perennial herb	invasive (Cal-IPC L)	x	x
Solidago elongata	West Coast Canada goldenrod	perennial herb	native		x
Soliva sessilis	South American soliva	annual herb	non-native	x	x
Sonchus asper ssp. *asper*	sow thistle	annual herb	invasive	x	x

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Sonchus oleraceus	sow thistle	annual herb	non-native	x	x
Stebbinsoseris heterocarpa	grassland Stebbinsoseris	annual herb	native		x
Stephanomeria virgata ssp. *pleurocarpa*	tall Stephanomeria	annual herb	native	x	
Symphyotrichum lanceolatum var. *hesperium*	Western lance leaf aster	perennial herb	native	x	
Taraxacum erythrospermum	red-seeded dandelion	perennial herb	non-native	x	
Taraxacum officinale	common dandelion	perennial herb	invasive	x	x
Tragopogon porrifolius	Salsify	biennial herb	invasive	x	
Uropappus lindleyi	silver puffs	annual herb	native	x	x
Urospermum picroides	bristly tail seed	annual, perennial herb	non-native	x	
Wyethia helenioides	whitehead Wyethia	perennial herb	native	x	x
Xanthium spinosum	spiny cocklebur	annual herb	non-native	x	x
Xanthium strumarium	cocklebur	annual herb	native	x	x
Azollaceae (Mosquito Fern Family)					
Azolla sp.	mosquito fern	aquatic herb	native	x	x
Boraginaceae (Borage Family)					
*Adelinia grandis (*syn. *Cynoglossum grande)*	Adelinia	perennial herb	native	x	x
Amsinckia intermedia	common fiddleneck	annual herb	native	x	x
Amsinckia menziesii	fiddleneck	annual herb	native	x	x
Amsinckia retrorsa	rigid fiddleneck	annual herb	native		x
Athysanus pusillus	dwarf athysanus	annual herb	native		x
Cryptantha microstachys	Tejon cryptantha	annual herb	native	x	
*Gruvelia pusilla (*syn. *Pectocarya pusilla)*	little gruvelia	annual herb	native	x	x
Plagiobothrys acanthocarpus	adobe allocarya	annual herb	native		x
Plagiobothrys bracteatus	bracted allocarya	annual herb	native	x	
Plagiobothrys canescens var. *canescens*	Valley popcornflower	annual herb	native	x	x
Plagiobothrys fulvus	fulvous popcornflower	annual herb	native		x
Plagiobothrys greenei	Greene's allocarya	annual herb	native	x	x
Plagiobothrys nothofulvus	rusty haired popcorn flower	annual herb	native	x	x
Plagiobothrys stipitatus var. *micranthus*	common vernal pool Allocarya	annual herb	native	x	
Plagiobothrys tenellus	slender popcorn flower	annual herb	native		x

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Plagiobothrys trachycarpus	rough fruited Allocarya	annual herb	native		x
Plagiobothrys undulatus	Coast Allocarya	annual herb	native		x
Brassicaceae (Mustard Family)					
Barbarea verna	wintercress	perennial herb	non-native		x
Barbarea vulgaris	yellow rocket	perennial herb	non-native	x	x
Brassica nigra	black mustard	annual herb	invasive (Cal-IPC M)	x	x
Brassica oleracea	cabbage	annual herb	non-native		x
Brassica rapa	common mustard	annual herb	invasive (Cal-IPC L)	x	
Capsella bursa-pastoris	shepherd's purse	annual herb	non-native	x	x
Cardamine californica	milkmaids	perennial herb	native	x	x
Cardamine hirsuta	hairy bitter cress	annual herb	non-native	x	
Cardamine oligosperma	Idaho bittercress	annual, perennial herb	native	x	x
Cardamine pensylvanica	Pennsylvania bittercress	perennial herb	native		x
Caulanthus lasiophyllus	California mustard	annual herb	native		x
Hirschfeldia incana	mustard	perennial herb	invasive (Cal-IPC M)	x	x
Lepidium draba	whitetop	perennial herb	invasive (Cal-IPC M)	x	x
Lepidium latifolium	perennial pepperweed	perennial herb	invasive (Cal-IPC H)	x	x
Lepidium nitidum	shining pepper grass	annual herb	native	x	x
Lepidium strictum	peppergrass	annual herb	native	x	
Nasturtium officinale	watercress	aquatic perennial herb	native	x	x
Raphanus sativus	jointed charlock	annual, biennial herb	invasive (Cal-IPC L)	x	
Rorippa curvisiliqua	curvepod yellow cress	annual, perennial herb	native	x	
Sinapis arvensis	charlock	annual herb	invasive (Cal-IPC L)	x	
Sisymbrium officinale	hedge mustard	annual herb	non-native		x
*Streptanthus albidus subsp. peramoenus (*syn. *Streptanthus glandulosus* ssp. *glandulosus)*	jewelflower	annual herb	**rare** (CRPR 1B.2)	x	
Thysanocarpus curvipes ssp. *curvipes*	fringe pod	annual herb	native	x	x

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Thysanocarpus laciniatus	narrow leaved lacepod	annual herb	native	x	
Tropidocarpum gracile	slender Tropidocarpum	annual herb	native	x	x
Cactaceae (Cactus Family)					
Opuntia ficus-indica	tuna	shrub (stem succulent)	non-native	x	
Campanulaceae (Bellflower Family)					
Downingia pulchella	flatface Downingia	annual herb	native	x	
Cannabaceae (Hemp Family)					
Cannabis sativa	herb	annual herb	non-native	x	
Celtis australis	European hackberry	deciduous tree	non-native	x	
Caprifoliaceae (Honeysuckle Family)					
Lonicera hispidula	pink honeysuckle	deciduous vine, shrub	native	x	x
Lonicera interrupta	chaparral honeysuckle	deciduous vine, shrub	native	x	
Lonicera subspicata var. *denudata*	Johnston's honeysuckle	deciduous shrub	native	x	x
Symphoricarpos albus var. *laevigatus*	snowberry	deciduous shrub	native	x	x
Symphoricarpos mollis	snowberry	deciduous shrub	native		x
Caryophyllaceae (Pink Family)					
Cerastium glomeratum	large mouse ears	annual herb	non-native	x	x
Herniaria hirsuta var. *cinerea*	Herniaria	annual herb	non-native		x
Sagina apetala	dwarf pearlwort	annual herb	non-native		x
Silene gallica	common catchfly	annual herb	non-native	x	x
Spergularia bocconi	Boccone's sand spurry	annual herb	non-native	x	x
Spergularia rubra	purple sand spurry	annual, perennial herb	non-native	x	x
Stellaria media	chickweed	annual herb	non-native	x	x
Chenopodiaceae (Goosefoot Family)					
Atriplex prostrata	fat-hen	annual herb	non-native	x	
Atriplex rosea	redscale	annual herb	non-native	x	
Beta vulgaris ssp. *maritima*	sea beet	perennial herb	non-native	x	
Chenopodium album	lamb's quarters	annual herb	non-native	x	
Chenopodium californicum	California goosefoot	perennial herb	native	x	x
Dysphania ambrosioides	Mexican tea	annual, perennial herb	non-native	x	
Dysphania pumilio	Tasmanian goosefoot	annual herb	non-native	x	

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Salicornia pacifica	pickleweed	perennial herb	native	x	
Salsola tragus	Russian thistle	annual herb	invasive (Cal-IPC L)	x	x
Cistaceae (Rock-Rose Family)					
Cistus incanus	hairy rockrose	evergreen shrub	non-native	x	x
Convolvulaceae (Morning-Glory Family)					
Calystegia collina	hillside morning glory	perennial herb	native		x
Calystegia purpurata ssp. *purpurata*	smooth Western morning glory	perennial herb	native	x	x
Calystegia subacaulis ssp. *subacaulis*	Cambria morning glory	perennial herb	native	x	x
Convolvulus arvensis	field bindweed	perennial herb, vine	invasive	x	x
Cressa truxillensis	alkali weed	perennial herb	native	x	
Cuscuta californica var. *californica*	California dodder	annual herb, vine	native	x	x
Crassulaceae (Stonecrop Family)					
Crassula connata	sand pygmy weed	annual herb	native	x	x
Dudleya cymosa ssp. *paniculata*	Diablo Range dudleya	perennial herb	native	x	x
Sedum spathulifolium	Pacific stonecrop	perennial herb	native	x	
Cucurbitaceae (Gourd Family)					
Marah fabacea	California man-root	perennial herb, vine	native	x	x
Cupressaceae (Cypress Family)					
Cupressus sempervirens	Italian cypress	evergreen tree	non-native	x	
Juniperus californica	California juniper	evergreen shrub	native	x	x
Sequoia sempervirens	Coast redwood	evergreen tree	native	x	
Cyperaceae (Carex Family)					
Carex nudata	torrent sedge	perennial herb	native	x	
Carex seratodens	saw-toothed sedge	perennial herb	native		x
Cyperus eragrostis	tall cyperus	perennial herb	native	x	x
Cyperus niger	brown cyperus	perennial herb	native	x	
Eleocharis macrostachya	spike rush	perennial herb	native	x	x
Eleocharis parishii	Parish's spikerush	perennial herb	native		x
Isolepis cernua	low bulrush	annual herb	native		x
Schoenoplectus acutus var. *occidentalis*	tule	perennial herb	native	x	x

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Schoenoplectus americanus	chairmaker's bulrush	perennial herb	native	x	
Cystopteridaceae (Fragile Fern Family)					
Cystopteris fragilis	brittle fern	fern	native		x
Datiscaceae (Datisca Family)					
Datisca glomerata	durango root	perennial herb	native	x	
Dipsaceae (Teasel Family)					
Dipsacus sativus	Fuller’s teasel	annual, biennial herb	invasive (Cal-IPC M)	x	
Dryopteridaceae (Wood Fern Family)					
Dryopteris arguta	wood fern	fern	native	x	x
Equisetaceae (Horsetail Family)					
Equisetum laevigatum	smooth scouring rush	fern	native	x	
Ericaceae (Heath Family)					
Arctostaphylos glauca	big berry manzanita	evergreen tree, shrub	native	x	
Euphorbiaceae (Spurge Family)					
Croton setiger	turkey-mullein	annual herb	native	x	x
Euphorbia ocellata ssp. *ocellata*	Valley spurge	annual herb	native	x	
Euphorbia peplus	petty spurge	annual herb	non-native	x	
Euphorbia spathulata	reticulate seeded spurge	annual herb	native	x	
Fabaceae (Legume Family)					
Acacia dealbata	silver wattle	evergreen tree, shrub	invasive (Cal-IPC M, SCVWD)	x	
Acmispon americanus var. *americanus*	Spanish lotus	annual herb	native	x	
Acmispon brachycarpus	short podded lotus	annual herb	native	x	x
Acmispon glaber var. *glaber*	deerweed	perennial herb	native	x	x
Acmispon wrangelianus	Chilean trefoil	annual herb	native	x	x
Astragalus gambelianus	loco weed	annual herb	native		x
Glycyrrhiza lepidota	licorice	perennial herb	native	x	
Hoita macrostachya	California hemp	perennial herb	native	x	
Lathyrus vestitus var. *vestitus*	hillside pea	perennial herb	native	x	
Lotus corniculatus	bird's foot trefoil	perennial herb	invasive	x	x
Lupinus albifrons var. *collinus*	silver bush lupine	evergreen shrub	native	x	x

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Lupinus bicolor	lupine	annual, perennial herb	native	x	x
Lupinus microcarpus var. *densiflorus*	secund chick lupine	annual herb	native	x	x
Lupinus microcarpus var. *microcarpus*	shaggy haired chick lupine	annual herb	native	x	x
Lupinus succulentus	arroyo lupine	annual herb	native	x	x
Medicago orbicularis		annual herb	non-native		x
Medicago polymorpha	California burclover	annual herb	invasive (Cal-IPC L)	x	x
Medicago sativa	alfalfa	perennial herb	non-native	x	x
Melilotus albus	white sweetclover	annual, biennial herb	invasive	x	
Melilotus indicus	annual yellow sweetclover	annual herb	non-native	x	x
Robinia pseudoacacia	black locust	deciduous tree	invasive (Cal-IPC L, SCVWD)	x	
Rupertia physodes	common rupertia	perennial herb	native		x
Trifolium albopurpureum	clover	annual herb	native		x
Trifolium angustifolium	narrow leaved clover	annual herb	non-native	x	x
Trifolium bifidum var. *bifidum*	pinole clover	annual herb	native		x
Trifolium bifidum var. *decipiens*	pinole clover	annual herb	native		x
Trifolium campestre	hop clover	annual herb	non-native	x	
Trifolium ciliolatum	tree clover	annual herb	native	x	x
Trifolium depauperatum	dwarf sack clover	annual herb	native	x	x
Trifolium dubium	shamrock	annual herb	non-native	x	
Trifolium fragiferum	strawberry clover	perennial herb	non-native	x	
Trifolium fucatum	bull clover	annual	native		x
Trifolium glomeratum	clustered clover	annual herb	non-native	x	x
Trifolium gracilentum	pin point clover	annual herb	native	x	x
Trifolium hirtum	rose clover	annual herb	invasive (Cal-IPC L)	x	x
Trifolium hydrophilum	saline clover	annual herb	**rare** (CRPR 1B.2)	x	
Trifolium microcephalum	small-head clover	annual herb	native		x
Trifolium microdon	Valparaiso clover	annual herb	native		x
Trifolium oliganthum	few flowered clover	annual herb	native		x

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Trifolium subterraneum	subterranean clover	annual herb	non-native	x	
Trifolium variegatum var. *variegatum*	variegated clover	annual herb	native	x	x
Trifolium willdenovii	tomcat clover	annual herb	native	x	x
Vicia americana ssp. *americana*	American vetch	perennial herb, vine	native	x	
Vicia benghalensis	purple vetch	annual herb, vine	non-native		x
Vicia sativa	spring vetch	annual herb, vine	non-native	x	x
Vicia villosa ssp. *villosa*	hairy vetch	annual herb, vine	invasive	x	x
Fagaceae (Oak Family)					
Quercus agrifolia var. *agrifolia*	Coast live oak	evergreen tree	native	x	x
Quercus berberidifolia	inland scrub oak	evergreen tree	native	x	x
Quercus douglasii	blue oak	deciduous tree	native	x	x
Quercus lobata	valley oak	deciduous tree	native	x	x
Quercus wislizeni var. *wislizeni*	interior live oak	evergreen tree, shrub	native	x	
Frankeniaceae (Frankenia Family)					
Frankenia salina	alkali heath	perennial herb	native	x	
Garryaceae (Silk Tassel Family)					
Garrya flavescens	ashy silk tassel	evergreen shrub	native		x
Gentianaceae (Gentian Family)					
Zeltnera muehlenbergii	Muehlenberg's centaury	annual herb	native		x
Geraniaceae (Geranium Family)					
Erodium botrys	big heron bill	annual herb	non-native	x	x
Erodium cicutarium	Coastal heron's bill	annual herb	invasive (Cal-IPC L)	x	x
Erodium moschatum	whitestem filaree	annual herb	invasive	x	x
Geranium dissectum	wild geranium	annual herb	invasive (Cal-IPC L)	x	x
Geranium molle	crane's bill geranium	annual, perennial herb	invasive	x	x
Grossulariaceae (Gooseberry Family)					
Ribes californicum var. *californicum*	California gooseberry	deciduous shrub	native	x	x
Haloragaceae (Water-Milfoil Family)					

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Myriophyllum sibiricum	Siberian water milfoil	aquatic perennial herb	native		x
Hydrophyllaceae (Waterleaf Family)					
Heliotropium curassavicum var. *oculatum*	seaside heliotrope	perennial herb	native	x	x
Nemophila heterophylla	canyon nemophila	annual herb	native	x	x
Nemophila menziesii var. *atomaria*	baby blue eyes	annual herb	native	x	
Nemophila menziesii var. *menziesii*	baby blue eyes	annual herb	native	x	x
Nemophila parviflora	small flowered nemophila	annual herb	native		x
Nemophila pedunculata	meadow nemophila	annual herb	native		x
Nemophila pulchella var. *fremontii*	Fremont's nemophila	annual herb	native		x
Phacelia distans	common phacelia	annual herb	native	x	x
Phacelia fremontii	Fremont's phacelia	annual herb	native	x	
Phacelia imbricata var. *imbricata*	imbricate phacelia	annual herb	native	x	x
Pholistoma auritum var. *auritum*	blue fiesta flower	annual herb	native	x	x
Pholistoma membranaceum	white fiesta flower	annual herb	native	x	x
Hypericaceae (St. John's Wort Family)					
Hypericum perforatum ssp. *perforatum*	Klamathweed	perennial herb	non-native		x
Iridaceae (Iris Family)					
Iris macrosiphon	ground iris	perennial herb	native	x	
Sisyrinchium bellum	blue eyed grass	perennial herb	native	x	x
Juglandaceae (Walnut Family)					
Carya illinoinensis	pecan	perennial herb	non-native	x	
Juglans hindsii	Northern California black walnut	deciduous tree	CBR	x	
Juglans regia	English walnut	deciduous tree	non-native	x	
Juncaceae (Rush Family)					
Juncus balticus ssp. *ater*	Baltic rush	perennial herb	native	x	x
Juncus bufonius var. *bufonius*	toad rush	annual herb	native	x	x
Juncus mexicanus	Mexican rush	perennial herb	native	x	
Juncus patens	rush	perennial herb	native	x	
Juncus xiphioides	iris leaved rush	perennial herb	native	x	x

Scientific Name	Common Name	habit	Status[1]	2020-2022	2023
Luzula comosa	hairy wood rush	perennial herb	native	x	
Triglochin scilloides	flowering-quillwort	annual herb	native		x
Lamiaceae (Mint Family)					
Acanthomintha lanceolata	Santa Clara thorn mint	annual herb	**rare** (CRPR 4.2)	x	
Lamium amplexicaule	henbit	annual herb	non-native	x	x
Marrubium vulgare	white horehound	perennial herb	invasive (Cal-IPC L)	x	x
Melissa officinalis	lemon balm	perennial herb	non-native	x	
Mentha pulegium	pennyroyal	perennial herb	invasive (Cal-IPC M)	x	x
Mentha suaveolens	apple mint	perennial herb	non-native	x	
Mentha xpiperita	peppermint	perennial herb	non-native		x
Monardella villosa ssp. *villosa*	coyote mint	perennial herb	native	x	x
Pogogyne serpylloides	thyme leaf mesa mint	annual herb	native	x	x
Salvia columbariae	chia sage	annual herb	native	x	x
Salvia mellifera	black sage	drought-deciduous shrub	native	x	x
Scutellaria siphocampyloides	gray leaved skullcap	perennial herb	native	x	x
Scutellaria tuberosa	skullcap	perennial herb	native		x
Stachys ajugoides	hedge nettle	perennial herb	native	x	x
Stachys albens	cobwebby hedge nettle	perennial herb	native	x	x
Stachys bullata	southern hedge nettle	perennial herb	native	x	x
Stachys rigida	rough hedgenettle	perennial herb	native		x
Trichostema lanceolatum	vinegarweed	annual herb	native	x	x
Lauraceae (Laurel Family)					
Umbellularia californica	California bay	evergreen tree	native	x	x
Liliaceae (Lily Family)					
Calochortus albus	white fairy lantern	perennial herb	native	x	x
Calochortus argillosus	clay mariposa lily	perennial bulbiferous herb	native	x	x
Calochortus venustus	butterfly mariposa lily	perennial herb	native	x	x
Fritillaria agrestis	stinkbells	perennial bulbiferous herb	**rare** (CRPR 4.2)		x
Loasaceae (Loasa Family)					
Mentzelia lindleyi	Lindley's blazing star	annual herb	native	x	

Scientific Name	Common Name	habit	Status[1]	2020-2022	2023
Lythraceae (Loosestrife Family)					
Lythrum californicum	common loosestrife	perennial herb	native	x	x
Lythrum hyssopifolia	hyssop loosestrife	annual, perennial herb	invasive	x	x
Malvaceae (Mallow Family)					
Malacothamnus arcuatus var. *elmeri* [syn. *M. hallii*])	Hall's bush mallow	evergreen shrub	**rare** (CRPR 1B.2)	x	x
Malva neglecta	dwarf mallow	annual, perennial herb	non-native	x	
Malva parviflora	cheeseweed	annual herb	non-native	x	
Malvella leprosa	alkali mallow	perennial herb	native	x	
Sidalcea malviflora ssp. *laciniata*	laciniate checker mallow	perennial herb (rhizomatous)	native	x	x
Marsileaceae (Marsilea Family)					
Marsilea vestita ssp. *vestita*	hairy pepperwort	aquatic fern	native	x	
Melanthiaceae (False-Hellebore Family)					
Toxicoscordion fremontii	Fremont’s star lily	perennial herb	native	x	x
Montiaceae (Miner’s Lettuce Family)					
Calandrinia menziesii	calandrinia	annual herb	native	x	x
Claytonia parviflora ssp. *parviflora*	miner's lettuce	annual herb	native	x	x
Claytonia perfoliata	rooreh	annual herb	native	x	x
Lewisia rediviva	bitter root	perennial herb	native		x
Montia fontana	water montia	annual herb	native		x
Myrsinaceae (Myrsine Family)					
*Lysimachia arvensis (*syn. *Anagallis arvensis)*	scarlet pimpernel	annual herb	non-native	x	x
Myrtaceae (Myrtle Family)					
Eucalyptus sp.	eucalyptus	evergreen tree	invasive (Cal-IPC L, W, SCVWD)	x	
Namaceae (Nama Family)					
Eriodictyon californicum	yerba santa	evergreen shrub	native	x	x
Oleaceae (Olive Family)					
Forestiera pubescens	desert olive	deciduous shrub	native	x	
Fraxinus dipetala	two petaled ash	deciduous tree, shrub	native	x	
Fraxinus sp.		deciduous tree	ornamental		x

Scientific Name	Common Name	habit	Status[1]	2020-2022	2023
Olea europaea	olive	evergreen tree, shrub	invasive (Cal-IPC L, SCVWD)	x	
Onagraceae (Evening-Primrose Family)					
Clarkia affinis	chaparral fairyfan	annual herb	native		x
Clarkia breweri	Brewer's clarkia	annual herb	**rare** (CRPR 4.2)	x	
Clarkia modesta	Waltham creek clarkia	annual herb	native		x
Clarkia purpurea ssp. *purpurea*	purple clarkia	annual herb	native	x	x
Clarkia purpurea ssp. *quadrivulnera*	purple clarkia	annual herb	native	x	
Clarkia unguiculata	woodland clarkia	annual herb	native	x	
Epilobium brachycarpum	willow herb	annual herb	native	x	x
Epilobium canum	California fuchsia	perennial herb	native	x	x
Epilobium ciliatum ssp. *ciliatum*	willow herb	perennial herb	native	x	
Epilobium densiflorum	willow herb	annual herb	native	x	x
Orchidaceae (Orchid Family)					
Piperia michaelii	Michael’s rein orchid	perennial herb	**rare** (CRPR 4.2)		x
Spiranthes porrifolia	Western ladies’ tresses	perennial herb	native	x	
Orobanchaceae (Broomrape Family)					
Aphyllon fasciculatum	clustered broomrape	perennial herb (parasitic)	native		x
Aphyllon purpureum	naked broom rape	annual herb	native		x
Castilleja attenuata	narrow leaved owl's clover	annual herb	native	x	x
Castilleja densiflora ssp. *densiflora*	dense flower owl's clover	annual herb	native	x	x
Castilleja exserta	owl's clover	annual herb	native	x	x
Castilleja foliolosa	Texas paintbrush	perennial herb	native	x	
Cordylanthus pilosus ssp. *pilosus*	hairy bird's beak	annual herb	native	x	x
Parentucellia viscosa	yellow parentucellia	annual herb	invasive (Cal-IPC L)	x	x
Pedicularis densiflora	warrior’s plume	perennial herb	native	x	
Triphysaria eriantha ssp. *eriantha*	butter 'n' eggs	annual herb	native	x	x
Triphysaria pusilla	little owl's clover	annual herb	native	x	x

Scientific Name	Common Name	habit	Status[1]	2020-2022	2023
Papaveraceae (Poppy Family)					
Ehrendorferia chrysantha	golden eardrops	perennial herb	native		x
Eschscholzia caespitosa	tufted eschscholzia	annual herb	native	x	x
Eschscholzia californica	California poppy	annual, perennial herb	native	x	x
Platystemon californicus	cream cups	annual herb	native	x	x
Phrymaceae (Lopseed Family)					
Diplacus aurantiacus	sticky monkeyflower	drought-deciduous shrub	native	x	x
Diplacus longiflorus	Southern bush monkeyflower	drought-deciduous shrub	native		x
Erythranthe arvensis	villous-bracted monkeyflower	annual herb	native		x
Erythranthe cardinalis	cardinal monkey flower	perennial herb	native	x	
Erythranthe guttata	seep monkey flower	annual, perennial herb (rhizomatous)	native	x	x
Erythranthe microphylla		annual, perennial herb	native		x
Mimetanthe pilosa	snouted monkey flower	annual herb	native	x	
Pinaceae (Pine Family)					
Pinus halepensis	Aleppo pine	evergreen tree	non-native	x	
Pinus sabiniana	gray pine	evergreen tree	native	x	x
Pittosporaceae (Pittosporum Family)					
Pittosporum tenuifolium	short leaf box	evergreen tree	non-native	x	
Plantaginaceae (Plantain Family)					
Antirrhinum thompsonii		perennial herb	native		x
Antirrhinum vexillocalyculatum ssp. *vexillocalyculatum*	wiry snapdragon	annual herb	native	x	x
Callitriche sp.	water-starwort	annual		x	
Collinsia heterophylla var. *heterophylla*	Chinese-houses	annual herb	native	x	x
Collinsia parviflora	few flowered blue eyed Mary	annual herb	native	x	x
Collinsia sparsiflora var. *collina*	hillside collinsia	annual herb	native	x	
Keckiella breviflora	gaping keckiella	deciduous shrub	native	x	
Kickxia spuria	fluellin	perennial herb	non-native	x	

Scientific Name	Common Name	habit	Status[1]	2020-2022	2023
Nuttallanthus texanus	blue toadflax	annual herb	native		x
Plantago coronopus	cut leaf plantain	annual herb	invasive	x	x
Plantago elongata	Coastal plantain	annual herb	native	x	
Plantago erecta	California plantain	annual herb	native	x	x
Plantago lanceolata	ribwort	perennial herb	invasive (Cal-IPC L)	x	x
Plantago major	common plantain	perennial herb	non-native	x	
Veronica americana	American brooklime	perennial herb	native	x	x
Veronica anagallis-aquatica	water speedwell	perennial herb	non-native	x	x
Veronica catenata	chain speedwell	perennial herb	non-native	x	
Veronica peregrina ssp. *xalapensis*	speedwell	annual herb	native	x	x
Veronica persica	bird's eye speedwell	annual herb	non-native	x	
Platanaceae (Sycamore Family)					
Platanus racemosa	California sycamore	deciduous tree	native	x	x
Poaceae (Grass Family)					
Agrostis hallii	Hall's bent grass	perennial grass	native	x	x
Aira caryophyllea	silvery hairgrass	annual grass	invasive	x	x
Arundo donax	giant reed	perennial grass	invasive (Cal-IPC H, SCVWD)	x	
Avena barbata	slim oat	annual grass	invasive (Cal-IPC M)	x	x
Avena fatua	wildoats	annual grass	invasive (Cal-IPC M)	x	x
Brachypodium distachyon	purple false brome	annual, perennial grass	invasive (Cal-IPC M)		x
Briza minor	little rattlesnake grass	annual grass	non-native	x	x
Bromus diandrus	ripgut brome	annual grass	invasive (Cal-IPC M)	x	x
Bromus hordeaceus	soft chess	annual grass	invasive (Cal-IPC L)	x	x
*Bromus rubens (*syn. *Bromus madritensis* ssp. *rubens)*	red brome	annual grass	invasive (Cal-IPC H)	x	x
Bromus sitchensis var. *carinatus (*syn. *Bromus carinatus)*	California brome	perennial	native	x	x
Bromus sterilis	sterile brome	annual grass	non-native		x
Crypsis alopecuroides	foxtail prickle grass	annual grass	non-native	x	

Scientific Name	Common Name	habit	Status[1]	2020-2022	2023
Crypsis schoenoides	swamp grass	annual grass	non-native	x	
Cynodon dactylon	Bermuda grass	perennial grass	invasive (Cal-IPC M)	x	x
Cynosurus echinatus	dogtail grass	annual grass	invasive (Cal-IPC M)	x	x
Deschampsia cespitosa	tufted hair grass	perennial grass	native	x	
Deschampsia danthonioides	annual hairgrass	annual grass	native		x
Digitaria sanguinalis	crabgrass	annual grass	non-native	x	
Distichlis spicata	salt grass	perennial grass	native	x	x
Echinochloa crus-galli	barnyard grass	annual grass	non-native	x	
Elymus caput-medusae	medusahead	annual grass	invasive (Cal-IPC H)		x
Elymus glaucus	blue wildrye	perennial grass	native	x	
Elymus multisetus	big squirreltail grass	perennial grass	native	x	x
Elymus trachycaulus ssp. *trachycaulus*	slender wheatgrass	perennial grass	native	x	x
Elymus triticoides	beardless wild rye	perennial grass	native	x	x
Festuca bromoides	brome fescue	annual grass	non-native	x	x
Festuca microstachys	small fescue	annual grass	native	x	x
Festuca myuros	rattail sixweeks grass	annual grass	invasive (Cal-IPC M)	x	x
Festuca octoflora	sixweeks grass	annual grass	native		x
Festuca perennis	Italian rye grass	annual, perennial grass	invasive (Cal-IPC M)	x	x
Festuca pratensis	meadow fescue	perennial grass	non-native	x	
Gastridium phleoides	nit grass	annual grass	non-native	x	x
Glyceria declinata	Low manna grass	perennial herb	invasive (Cal-IPC M)		x
Hordeum brachyantherum	meadow barley	perennial grass	native	x	x
Hordeum marinum ssp. *gussoneanum*	barley	annual grass	invasive (Cal-IPC M)	x	x
Hordeum murinum ssp. *leporinum*	farmer's foxtail	annual grass	invasive (Cal-IPC M)	x	x
Koeleria macrantha	June grass	perennial grass	native	x	x
Lamarckia aurea	goldentop	annual grass	non-native	x	x
Melica californica	California melic	perennial grass	native	x	x
Melica imperfecta	Coast Range melic	perennial grass	native	x	x
Melica torreyana	Torrey’s melica	perennial grass	native	x	
Paspalum dilatatum	dallis grass	perennial grass	non-native	x	

Scientific Name	Common Name	habit	Status[1]	2020-2022	2023
Paspalum distichum	knot grass	perennial grass	native	x	
Phalaris aquatica	Harding grass	annual grass	non-native	x	x
Phalaris minor	Mediterranean canarygrass	annual grass	non-native	x	x
Poa annua	annual blue grass	annual grass	non-native	x	x
Poa bulbosa	bulbous blue grass	perennial grass	non-native		x
Poa secunda ssp. *secunda*	Sandberg's bluegrass	perennial grass	native	x	x
Poa trivialis	rough blue grass	perennial grass	non-native	x	
Polypogon monspeliensis	annual beard grass	annual grass	invasive (Cal-IPC L)	x	x
Stipa lepida	foothill needle grass	perennial grass	native		x
Stipa miliacea var. *miliacea*	smilo grass	perennial grass	invasive (Cal-IPC L)	x	
Stipa pulchra	purple needle grass	perennial grass	native	x	x
Triticum aestivum	common wheat	annual grass	non-native		x
Polemoniaceae (Phlox Family)					
Collomia heterophylla	varied leaved collomia	annual herb	native	x	
Gilia achilleifolia ssp. *multicaulis*	many stemmed gilia	annual herb	native	x	x
Gilia clivorum	purple spot gilia	annual herb	native		x
Gilia tricolor ssp. *tricolor*	bird's eyes	annual herb	native	x	x
Leptosiphon androsaceus	false babystars	annual herb	native	x	x
Leptosiphon bicolor	true babystars	annual herb	native	x	x
Leptosiphon ciliatus	whiskerbrush	annual herb	native	x	
Leptosiphon grandiflorus	large flowered leptosiphon	annual herb	**rare** (CRPR 4.2)	x	
Microsteris gracilis	slender phlox	annual herb	native	x	
Navarretia mellita	skunk navarretia	annual herb	native	x	x
Navarretia prostrata	prostrate navarretia	annual herb	**rare** (CRPR 1B.2)	x	
Navarretia pubescens	purple navarretia	annual herb	native	x	x
Polygonaceae (Buckwheat Family)					
Chorizanthe membranacea	pink spineflower	annual herb	native	x	x
Eriogonum fasciculatum	California buckwheat	evergreen shrub	native	x	x
Eriogonum nudum	naked buckwheat	drought-deciduous shrub	native	x	x
Eriogonum roseum	wand buckwheat	annual herb	native	x	

Scientific Name	Common Name	habit	Status[1]	2020-2022	2023
Eriogonum vimineum	wicker stemmed eriogonum	annual herb	native		x
Eriogonum wrightii var. *trachygonum*	Wright s buckwheat	perennial herb, shrub	native	x	x
Persicaria amphibia	water smartweed	aquatic perennial herb	native	x	
Persicaria punctata	dotted smartweed	perennial herb	native	x	
Polygonum aviculare	prostrate knotweed	annual, perennial herb	non-native	x	
Pterostegia drymarioides	fairy mist	annual herb	native	x	x
Rumex acetosella	sheep sorrel	perennial herb	invasive (Cal-IPC M)	x	x
Rumex conglomeratus	green dock	perennial herb	non-native	x	
Rumex crispus	curly dock	perennial herb	invasive (Cal-IPC L)	x	x
Rumex pulcher	fiddleleaf dock	perennial herb	non-native	x	x
Rumex salicifolius	willow leaved dock	perennial herb	native	x	x
Polypodiaceae (Polypody Family)					
Polypodium californicum	California polypody	fern	native	x	x
Polypodium scouleri	leather fern	fern	native		x
Portulacaceae (Purslane Family)					
Portulaca oleracea	common purslane	annual herb	non-native	x	
Potamogetonaceae (Pondweed Family)					
Potamogeton nodosus	long leaved pond weed	perennial aquatic herb	native		x
Primulaceae (Primrose Family)					
Primula clevelandii var. *patula*	padre's shooting star	perennial herb	native	x	x
Primula hendersonii	mosquito bill	perennial herb	native		x
Pteridaceae (Brake Family)					
Adiantum jordanii	adiantum	fern	native	x	x
Pellaea andromedifolia	coffee fern	fern	native	x	x
Pentagramma triangularis ssp. *triangularis*	gold back fern	fern	native	x	x
Ranunculaceae (Buttercup Family)					
Clematis lasiantha	pipestem	perennial herb, vine	native	x	x
Delphinium californicum ssp. *interius*	Coastal larkspur	perennial herb	**rare** (CRPR 1B.2)	x	x

Scientific Name	Common Name	habit	Status[1]	2020-2022	2023
Delphinium hesperium ssp. *hesperium*	Western larkspur	perennial herb	native	x	
Delphinium parryi ssp. *parryi*	Parry's larkspur	perennial herb	native		x
Delphinium patens ssp. *patens*	spreading larkspur	perennial herb	native	x	x
Ranunculus aquatilis var. *diffusus*	white water butter cup	aquatic perennial herb	native	x	x
Ranunculus californicus	common buttercup	perennial herb	native	x	x
Ranunculus hebecarpus	pubescent fruited buttercup	annual herb	native	x	
Ranunculus muricatus	buttercup	annual, perennial herb	non-native	x	
Thalictrum fendleri var. *polycarpum*	Torrey's meadow rue	perennial herb	native	x	x
Rhamnaceae (Buckthorn Family)					
Ceanothus cuneatus ssp. *cuneatus*	buck brush	evergreen shrub	native	x	x
Frangula californica	California coffeeberry	evergreen shrub	native	x	x
Rhamnus crocea	redberry	evergreen shrub	native	x	x
Rhamnus ilicifolia	evergreen buckthorn	evergreen shrub	native	x	
Adenostoma fasciculatum var. *fasciculatum*	chamise	evergreen tree, shrub	native	x	x
Rosaceae (Rose Family)					
Amelanchier utahensis	pale leaved serviceberry	deciduous shrub	native		x
Aphanes occidentalis	ladies' mantle	annual, perennial herb	native		x
Cercocarpus betuloides var. *betuloides*	birch leaf mountain mahogany	evergreen tree, shrub	native	x	x
Heteromeles arbutifolia	toyon	evergreen shrub	native	x	x
Malus sp.	apple	deciduous tree	non-native	x	
Prunus dulcis	almond	deciduous tree	non-native	x	
Prunus ilicifolia ssp. *ilicifolia*	holly leaf cherry	evergreen tree, shrub	native	x	x
Pyrus sp.	pear	deciduous tree	non-native	x	
Rosa californica	California wild rose	deciduous shrub	native	x	x
Rubus armeniacus	Himalayan blackberry	evergreen shrub	invasive (Cal-IPC H)	x	
Rubus ursinus	California blackberry	deciduous vine, shrub	native	x	
Rubiceae (Madder Family)					

Scientific Name	Common Name	habit	Status[1]	2020-2022	2023
Galium andrewsii ssp. *andrewsii*	phlox leaved bedstraw	perennial herb	native	x	
Galium andrewsii ssp. *gatense*	serpentine bedstraw	perennial herb	**rare** (CRPR 4.2)		x
Galium aparine	cleavers	annual herb	native	x	x
Galium murale	tiny bedstraw	annual herb	non-native	x	
Galium parisiense	wall bedstraw	annual herb	non-native	x	
Galium porrigens	climbing bedstraw	deciduous vine, shrub	native	x	x
Rutaceae (Citrus Family)					
Ptelea crenulata	hop tree	deciduous tree, shrub	native	x	x
Salicaceae (Willow Family)					
Populus fremontii ssp. *fremontii*	cottonwood	deciduous tree	native	x	
Populus trichocarpa	black cottonwood	deciduous tree	native	x	
Salix exigua	narrowleaf willow	deciduous tree, shrub	native	x	
Salix gooddingii	Goodding's willow	deciduous tree	native	x	
Salix laevigata	polished willow	deciduous tree	native	x	x
Salix lasiolepis	arroyo willow	deciduous tree, shrub	native	x	x
Sapindaceae (Soapberry Family)					
Acer negundo	boxelder	deciduous tree	native	x	
Aesculus californica	buckeye	deciduous tree	native	x	x
Saxifragaceae (Saxifrage Family)					
Lithophragma heterophyllum	woodland star	perennial herb	native	x	x
Lithophragma parviflorum var. *parviflorum*	pink woodland star	perennial herb	native	x	x
Micranthes californica	Greene's saxifrage	perennial herb	native	x	x
Scrophulariaceae (Figwort Family)					
Scrophularia californica	California bee plant	perennial herb	native	x	x
Verbascum blattaria	moth mullein	perennial herb	non-native	x	
Selaginellaceae (Spike-Moss Family)					
Selaginella bigelovii	Bigelow's moss fern	moss	native	x	
Simaroubaceae (Quassia Family)					
Ailanthus altissima	tree of heaven	deciduous tree	invasive (Cal-IPC M, SCVWD)	x	

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Solanaceae (Nightshade Family)					
Datura wrightii	jimsonweed	perennial herb	native	x	
Lycopersicon esculentum	tomato	annual, perennial herb	non-native	x	
Nicotiana acuminata var. *multiflora*	many flowered tobacco	annual herb	non-native	x	
Solanum americanum	white nightshade	annual, perennial herb	native	x	
Solanum umbelliferum	blue witch	drought-deciduous shrub	native	x	x
Tamaricaceae (Tamarisk Family)					
Tamarix parviflora	tamarisk	deciduous tree, shrub	invasive (Cal-IPC H)	x	
Tamarix ramosissima	tamarisk	deciduous tree, shrub	invasive (Cal-IPC H)	x	
Themidaceae (Brodiaea Family)					
Bloomeria crocea var. *crocea*	golden stars	perennial herb	native		x
Brodiaea elegans ssp. *elegans*	harvest brodiaea	perennial herb	native	x	x
*Dipterostemon capitatus subsp. capitatus (*syn. *Dichelostemma capitatum* ssp. *capitatum)*	blue dicks	perennial herb	native	x	x
Muilla maritima	common muilla	perennial herb	native		x
Triteleia hyacinthina	wild hyacinth	perennial herb	native	x	x
Triteleia laxa	Ithuriel's spear	perennial herb	native	x	x
Typhaceae (Cattail Family)					
Sparganium eurycarpum	broadfruit bur reed	perennial herb	native	x	
Typha angustifolia	narrow leaf cattail	aquatic perennial herb	non-native	x	
Typha latifolia	broadleaf cattail	aquatic perennial herb	native	x	
Ulmaceae (Elm Family)					
Ulmus americana	American elm	deciduous tree	non-native	x	
Urticaceae (Nettle Family)					
Urtica dioica	stinging nettle	perennial herb	native	x	x
Urtica urens	annual stinging nettle	annual herb	non-native	x	x
Valerianaceae (Valerian Family)					
Plectritis ciliosa	long spurred plectritis	annual herb	native	x	x

Scientific Name	Common Name	habit	Status[1]	2020-2022	2023
Plectritis congesta	sea blush	annual herb	native		x
Plectritis macrocera	plectritis	annual herb	native	x	x
Verbenaceae (Verbena Family)					
Phyla lanceolata	lance leaf lippia	perennial herb	native	x	x
Phyla nodiflora	common lippia	perennial herb	native	x	x
Verbena bracteata	bracted verbena	annual, perennial herb	native	x	
Verbena lasiostachys var. *scabrida*	robust vervain	perennial herb	native	x	x
Viburnaceae (Muskroot Family)					
*Sambucus mexicana (*syn. *Sambucus nigra* ssp. *caerulea)*	elderberry	deciduous tree, shrub	native	x	x
Violaceae (Violet Family)					
Viola pedunculata	California golden violet	perennial herb	native	x	x
Viscaceae (Mistletoe Family)					
Arceuthobium campylopodum	pine dwarf mistletoe	parasitic perennial herb	native	x	
Phoradendron leucarpum ssp. *macrophyllum*	big leaf mistletoe	parasitic shrub	native	x	
Vitaceae (Grape Family)					
Vitis vinifera	cultivated grape	deciduous vine, shrub	non-native	x	
Zannichelliaceae (Horned-Pondweed Family)					
Zannichellia palustris	horned pondweed	perennial herb	native	x	x
Zygophyllaceae (Caltrop Family)					
Tribulus terrestris	puncture vine	annual herb	invasive (Cal-IPC L)	x	

Note: Plant list includes all species observed during PREP botanical surveys, which includes all the species observed within the study area.

Sub-exhibit 1B2 – Special-Status Plant Species Observed Representative Photographs



Photo 1. Close-up of Hall's bush mallow (*Malacothamnus arcuatus* var. *elmeri* [syn. *M. hallii*) CRPR 1B.2.



Photo 2. Population of Hall's bush mallow dispersed throughout California sagebrush.



Photo 3. Close-up of woodland woollythreads (*Monolopia gracilens*) CRPR 1B.2.



Photo 4. Woodland woollythreads on an exposed, rocky slope.

Exhibit 1C – California Red-legged Frog Site Assessment



Exhibit 1C - California Red-Legged Frog Site Assessment

Pacheco Reservoir Expansion Project Design Level Geotechnical Investigations

June 2024

Prepared by:

AECOM

Stantec GEI

Prepared for:

Valley Water

Valley Water Project Number: 91954002

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Sub-Exhibits

Sub-exhibit 1C1 – CRLF Habitat Site Assessment Data Sheets
Sub-exhibit 1C2 – Site Assessment Results and Survey Locations

Acronyms and Abbreviations

AF	acre-feet
CAS	California Academy of Sciences
CDFW	California Department of Fish and Wildlife
CNDDB	California Natural Diversity Database
CRLF	California red-legged frog (*Rana draytonii*)
ESA	Endangered Species Act
PREP	Pacheco Reservoir Expansion Project
Project	Design Level Geotechnical Investigations
Reclamation	Bureau of Reclamation
SCVHP	Santa Clara Valley Habitat Plan
Stantec	Stantec Consulting Inc.
USFWS	United States Fish and Wildlife Service

Executive Summary

This exhibit to the Biological Resources Assessment Report documents the findings of the California red-legged frog (*Rana draytonii*) (CRLF) site assessment within and adjacent to the Pacheco Reservoir Expansion Project's (PREP) Design Level Geotechnical Investigations (Project) study area. The total area evaluated in this site assessment includes 55 acres within the Project study area and an additional 9,567 acres associated with a 1-mile buffer surrounding the Project study area (i.e., assessment area). Potential CRLF habitats within the area evaluated in this site assessment consists of aquatic breeding, aquatic nonbreeding, and upland/dispersal habitats. There were 54 aquatic habitat features evaluated in this CRLF site assessment; 4 of those 54 aquatic features are located within the Project study area. Of the 54 aquatic habitat features, 40 provide the essential components of CRLF breeding habitat (i.e., have a sufficient depth and hydroperiod for egg laying and larval development) within the assessment area. None of these features are located within the Project study area. There are five aquatic features which provide suboptimal or marginal (i.e., low quality) CRLF breeding habitat within the assessment area, and none within the Project study area. These aquatic features are considered suboptimal or marginal CRLF breeding habitat due to additional limiting habitat characteristics (e.g., observations of predators/competitors, nonnative and invasive species, and/or a lack of vegetation for egg mass attachment). A total of nine features (four are within the Project study area), do not provide suitable breeding habitat as the features lack suitable hydroperiod support breeding and larval development. However, many do provide potential dispersal and nonbreeding aquatic habitat for the species. Table ES-1 below provides a summary of the identified aquatic features within the Project study area and assessment area.

Table ES-1. Summary of Aquatic Features Identified

Analysis Area	Identified Aquatic Features			Total
	Breeding Habitat	Low Quality Breeding Habitat	Non-Breeding Habitat	
Project Study Area	0	0	4	4
Assessment Area[1]	40	5	5	50
TOTAL	**40**	**5**	**9**	**54**

Notes:
[1] Assessment area consists of a 1-mile buffer around the Project study area. The number of aquatic features represented in this table within the assessment area exclude those found within the study area.

Approximately 41 acres of potential upland/dispersal habitat for the species is present in the Project study area and an additional 9,131 acres within the assessment area. These upland habitats generally consist of grasslands, woodlands, and scrub communities within the assessment area.

Based on the results of the CRLF habitat assessment and surveys, this species is considered present as it was observed within aquatic features that are connected to the Project study area (South Fork Pacheco Creek), as well as other features within the assessment area. The Project study area is within the current range for CRLF with numerous occurrences documented within the assessment area. In addition, USFWS designated critical habitat occurs throughout most of the Project study area.

Chapter 1. Introduction

This exhibit to the Biological Resources Assessment Report was prepared in support of the Design Level Geotechnical Investigations (Project) that are proposed in support of Valley Water's Pacheco Reservoir Expansion Project (PREP). The Project is series of focused geotechnical investigation activities intended to inform the PREP design and planning processes. This exhibit has been prepared to describe the methods and results of the California red-legged frog (*Rana draytonii*) (CRLF) site assessment. The results presented in this document are intended to further develop an understanding of CRLF potential to occur within and adjacent to the Project study area, identification of potential CRLF habitat, and provide both qualitative and quantitative information regarding CRLF potential habitat. The information generated from this exhibit is expected to be used to inform Project impact assessments/calculations for the Project.

Chapter 2. Methods

2.1 Project Study Area and Assessment Area

The Project study area for the purposes of this exhibit, is the same as the comprehensive Project footprint. The study area encompasses approximately 55 acres and includes all currently proposed activity areas associated with the Project (e.g., access routes, borings, test pits). The assessment area includes all areas within 1-mile of the Project study area and is approximately 9,567 acres in size. The location and boundaries of the Project study area and the assessment area are illustrated in Figure 2-1.

2.2 Site Assessment Methods

The site assessment was conducted in accordance with the U.S. Fish and Wildlife Service's (USFWS) *Revised Guidance on Site Assessments and Field Surveys for the California Red-Legged Frog* (USFWS 2005). The guidance provided by USFWS identifies criteria for performing CRLF site assessments and data sheets for surveys conducted in and around aquatic and riparian habitats to ensure standardization for CRLF site assessments across projects. The criteria included in the USFWS guidance consists of a review of the following: (1) documentation that the Project study area is within the current or historical range of the species; (2) identification of documented occurrences/records of the species within 1 mile of the Project study area; and (3) the identification of potential habitat for CRLF within the Project study area and assessment area (i.e., within 1 mile of the Project study area).

CRLF occurrences records within the assessment area were compiled from a review of the following sources:

- California Department of Fish and Wildlife (CDFW) and California Natural Diversity Data Base (CNDDB) (CDFW 2023)
- USFWS Recovery Plan for the California Red-Legged Frog (USFWS 2002)
- California Academy of Sciences (CAS) (CAS 2023)
- iNaturalist (2023) CRLF observations
- Other publicly available databases and literature

Aquatic features within the assessment area were identified and mapped using publicly available desktop resources, such as current and historic aerial imagery, topographic maps, USFWS National Wetland Inventory maps, and USFWS guidance (e.g., USFWS 2005) in addition to reconnaissance-level surveys. Reconnaissance-level visual assessments were conducted for the potential aquatic habitats located within the Project study area.

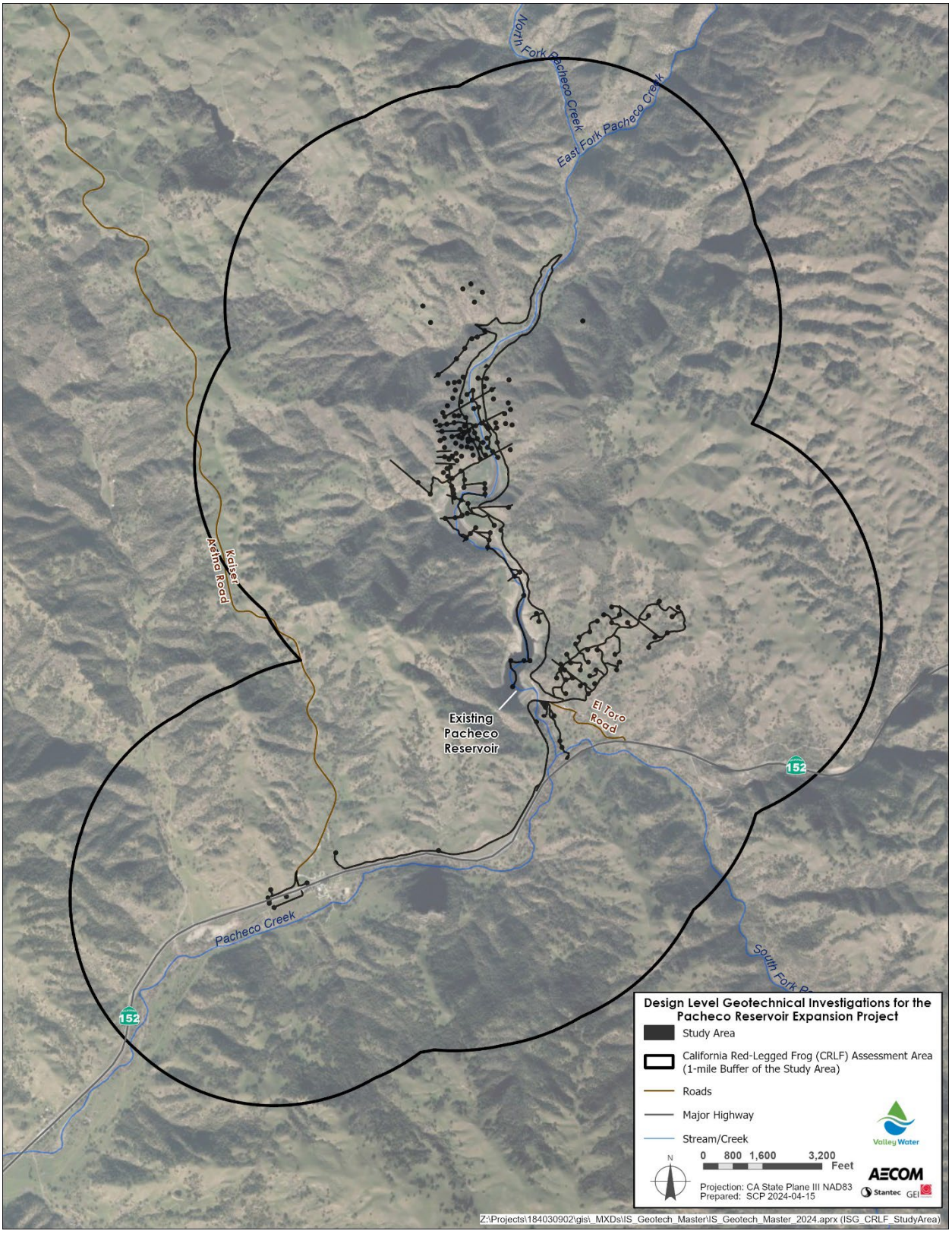


Figure 2-1. Project Study Area and Assessment Area

Assessment surveys documented the conditions at each of the potential aquatic features visited using the methods detailed in the *Revised Guidance on Site Assessments and Field Surveys for the California Red-Legged Frog* (USFWS 2005). Data collected included feature type (e.g., stock pond, perennial stream), apparent seasonality, approximate size (e.g., surface area or stream width), estimated depth at bank full, water depth at the time of the field survey, stream gradient, stream morphology (e.g., pools, riffles), substrate, vegetation (e.g., emergent, overhanging, dominant species), and bank/shoreline descriptions. Other aquatic habitat characteristics such as side channels or backwater areas were documented. Incidental observations of potential predators such as American bullfrogs (*Lithobates catesbeianus*) and centrarchids (e.g., bass, sunfish) were noted. Field assessments were conducted from the shoreline of each potential aquatic habitat or through the use of binoculars when not accessible. Representative photographs depicting habitat conditions were also taken at each of the locations visited during the field surveys. Potential CRLF habitats on private property without legal access, which included those within the assessment area, were assessed by reviewing current and historic aerial imagery (e.g., Google Earth), topographic maps, and/or from points of public access (e.g., roadways adjacent to ponds). To determine the hydroperiods of the inaccessible aquatic features, aerial images from multiple years and seasons were reviewed in Google Earth.

2.3 Assessment Timeframe

Stantec Consulting Inc. (Stantec) biologists conducted reconnaissance-level pedestrian surveys to document potential CRLF habitat within the assessment area. The site assessment surveys were conducted on March 10–12 and 30, April 1–2, and May 7–8, 2020. Additional surveys were conducted on September 21, 2022, and March 30 and 31, 2023. The timing of the field surveys was performed to coincide when CRLF tadpoles or metamorphs would be present within aquatic features (e.g., ponds) and while the aquatic features were inundated.

2.4 Biologists Qualifications

Stantec biologists, Jared Elia, Sara Cortez, Rob Stoddard, Scott Elder, Nicolet Murphy and Brendan Cohen performed the reconnaissance-level surveys. A summary of their qualifications and experience performing CRLF surveys and site assessments are summarized below.

- Jared Elia – Over 15 years of experience conducting site assessments for CRLF, and performing reconnaissance and protocol-level surveys, which has included capture and relocation of individuals. He attended the Rare Pond Species Survey Techniques workshop offered by Sonoma State University and has been approved as a qualified biologist on numerous projects by CDFW and USFWS. Jared also has over 20 hours of protocol-level survey and handling hours for CRLF.

- Sara Cortez – Over 15 years of experience conducting site assessments for CRLF, and performing reconnaissance and protocol-level surveys, which has included capture and relocation of individuals. She has conducted surveys and site assessments for this species throughout the San Francisco Bay area and Sacramento-San Joaquin Valley.

- Rob Stoddard – Over 14 years of experience conducting site assessments for aquatic species, including CRLF. He has several years of experience conducting foothill yellow-legged frog surveys and is experienced identifying the unique characteristics that distinguish CRLF apart from other amphibian species.

- Scott Elder – Over 7 years of experience conducting site assessments and reconnaissance-level surveys for CRLF throughout the San Francisco Bay area. He has

also attended the Rare Pond Species Survey Techniques workshop offered by Sonoma State University. Scott is experienced in identifying the unique characteristics that distinguish CRLF apart from other amphibian species.

- Brendan Cohen – Over 7 years of experience conducting site assessments and reconnaissance-level surveys for CRLF. He has also attended the Rare Pond Species Survey Techniques workshop offered by Sonoma State University and the Amphibian of the Bay Area workshop in Santa Rosa, California. Brendan is experienced in identifying the unique characteristics that distinguish CRLF apart from other amphibian species.
- Nicolette Murphy – 7 years of experience conducting site assessments and aquatic surveys for CRLF. She has attended the red-legged frog handling level II workshop offered by the Wildlife Project and has a 10(a)1(A) Recovery Permit for the species.

Chapter 3. Species Natural History

The CRLF was federally listed by the USFWS under the Endangered Species Act (ESA) as threatened on May 23, 1996 (USFWS 1996). It is also a CDFW species of special concern. Revised Critical Habitat for this species was designated by USFWS on March 17, 2010 (USFWS 2010). The CRLF is the largest native frog in California (44–131 millimeters snout-vent length). The historical range of CRLF extended from Riverside County to Mendocino County along the Coast Range; from Calaveras County to Butte County in the Sierra Nevada; and to Baja California, Mexico (USFWS 2017). CRLF are still abundant within portions of the San Francisco Bay area (including Marin County) and the central coast (USFWS 2017).

The CRLF inhabits a variety of aquatic, upland, and riparian environments, including ephemeral and permanent ponds, seasonal wetlands, perennial creeks, intermittent streams, manmade aquatic features (e.g., stock ponds), riparian corridors, nonnative annual grasslands, and oak savannahs (USFWS 1996). Preferred breeding habitat consists of still or slow-moving water or deep-water pools where it deposits large egg masses, usually attached to submergent or emergent vegetation. Breeding typically occurs during winter and early spring (i.e., late November through April). Well-vegetated upland habitats in proximity of a riparian corridor may also provide sheltering habitat during the breeding season. During the nonbreeding season (i.e., generally from May through mid-November), CRLF utilize a variety of aquatic habitats including small pools in streams, springs, water traps and other perennial water bodies (Miller et al. 1996; Fellers and Kleeman 2007). During the dry summer months, CRLF seek refuge in small mammal burrows, areas with structural cover, and moist leaf litter commonly associated with adjacent riparian habitat to avoid desiccation (Rathbun et al. 1993; Jennings and Hayes 1994). CRLFs have been recorded to cover distances from 0.25 mile to more than 2 miles without apparent regard to topography, vegetation type, or riparian corridors (USFWS 2005; Tartarian 2008).

Introduced species such as American bullfrogs, largemouth bass (*Micropterus salmoides*), common carp (*Cyprinus carpio*), and mosquitofish (*Gambusia affinis*) may prey upon one or more life stages (i.e., eggs, tadpoles, or adults) of CRLF, but the species can also coexist in certain habitats (Stebbins and McGinnis 2012; Moyle 1973). It is estimated that the CRLF has disappeared from approximately 75 percent of its former range and has nearly been extirpated from the Sierra Nevada, Central Valley and much of southern California (Miller et al. 1996).

3.1 Critical Habitat

The federal ESA requires the federal government (i.e., USFWS) to designate critical habitat for any species it lists as endangered or threatened. It also requires the federal government to develop and implement recovery plans to promote the conservation of threatened and endangered species. The CRLF has designated critical habitat and is the subject of the USFWS Recovery Plan for the species (USFWS 2010).

Critical habitat is identified by the presence of physical or biological features, previously termed primary constituent elements, that are essential to the conservation of a federally listed species upon which designated or proposed critical habitat for the species is based. Physical and biological features may include, but are not limited to: space for growth of individuals and populations; food, water, air, light, minerals, or other nutritional or physiological requirements; cover or shelter; sites for breeding, reproduction, rearing of offspring, germination, or seed

dispersal; and habitats that are protected from disturbance or are representative of the species' historic geographic and ecological distribution. The physical and biological features for CRLF critical habitat are aquatic and upland areas where suitable breeding and nonbreeding habitat is interspersed throughout the landscape and is interconnected by unfragmented dispersal habitat. Aquatic habitat includes standing bodies of fresh water such as stock ponds or slow-moving streams or pools within streams, or other ephemeral or permanent water bodies. Aquatic breeding habitat must hold water for a minimum of 20 weeks per year. Upland habitat includes areas within one mile of the edge of riparian or aquatic habitat and composed of grassland, woodland, wetland/riparian vegetation communities and may include structural features such as rocks, woody debris and leaf litter, and small mammal burrows. Dispersal habitat includes upland habitats or riparian habitats within one mile of occupied locations.

Chapter 4. Site Assessment Results

4.1 Range and Critical Habitat

CRLF is endemic (native and restricted) to California and Baja California, Mexico at elevations ranging from sea level to approximately 5,000 feet (1,500 meters). The historical range of CRLF extended from Riverside County to Mendocino County along the Coast Range; from Calaveras County to Butte County in the Sierra Nevada; and to Baja California, Mexico (USFWS 2017). CRLF are still abundant within portions of the San Francisco Bay area and the central coast (USFWS 2017). Based on this information, the entire Project study area and assessment area is located within the historic and current range for CRLF.

Approximately 9,622 acres of USFWS-designated critical habitat for CRLF, STC-2 unit, is located throughout the Project study area and assessment area (USFWS 2023). Physical and biological features (i.e., primary constituent elements) of critical habitat for CRLF include aquatic breeding and nonbreeding habitat, upland habitat, and dispersal habitat (USFWS 2010). Based on survey efforts conducted, the physical and biological features for CRLF critical habitat are present in the STC-2 unit boundary within the Project study area and assessment area.

4.2 Known Occurrences

A search of the CNDDB (CDFW 2023) indicated that there are six occurrences of CRLF within approximately one mile of the Project study area (Figure 4-1). CRLF CNDDB occurrences within the assessment area are described in Table 4-1. Stantec staff also observed CRLF in a stock pond and a drainage to the east of the assessment area as part of a CRLF habitat assessment for PREP. The Stantec observations of CRLF are not yet documented in CNDDB.

Table 4-1. California Red-Legged Frog Occurrences within 1 Mile of the Project Study Area

CNDDB Occurrence Number[1]	Feature Type	Distance from Project Study Area (miles)	Year Observed
#808	A 14-acre, usually perennial pond, pond is adjacent to Pacheco Creek.	0.3 mile	2005
#1621	Pools in intermittent stream	<0.1 mile	2020
#1623	A pond surrounded by oak woodland	1 mile	2017
#1630[1]	Subadult observed along the South Fork Pacheco Creek	0.5 mile	2020
#1633	Adult collected in North Fork Pacheco Creek	0.9 mile	1993

[1] Occurrence consists of two polygons/mapped areas.

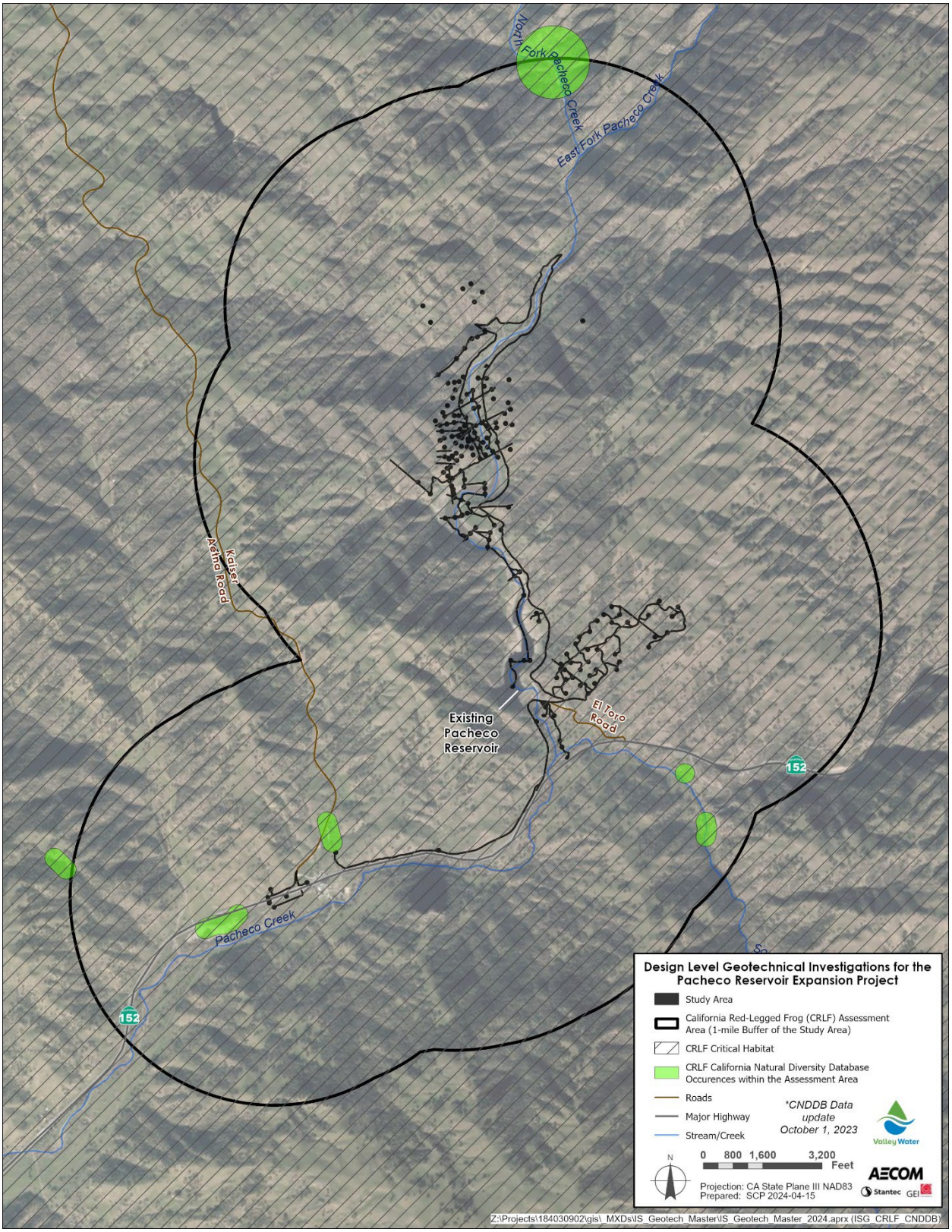


Figure 4-1. California Red-legged Frog California Natural Diversity Database Occurrences within 1-Mile of the Project Study Area

4.3 Potential CRLF Habitats

Potential habitats for CRLF identified in the assessment area includes aquatic breeding, aquatic nonbreeding, and upland and dispersal habitats. Figure 4-2 provides the locations of aquatic habitats within the Project study area and assessment area. Copies of habitat site assessment data sheets are presented in Sub-exhibit 1C1.

State Route 152 appears to function as a migration barrier for CRLF within the assessment area. This barrier can reduce and/or prevent CRLF from breeding in aquatic habitats and/or using potential summer habitat that require crossing the highway, because individuals can be killed trying to cross the roadway or can become desiccated with no cover trying to cross during the hot summer months. While there are drainage features that may provide travel corridors under the highway, no documentation exists that CRLF use these corridors.

4.3.1 Aquatic Habitats

The aquatic features that were evaluated during the CRLF habitat assessment consisted of 4 aquatic features located within the Project study area and 50 are located beyond the Project study area within the assessment area. Of the 54 total aquatic features, 40 provide essential components of CRLF breeding habitat, 5 provide low-quality/marginal habitat and 9 features do not provide breeding habitat.

A summary of the identified aquatic features within the Project study area and adjacent assessment area is provided in Table 4-2 below.

Table 4-2. Summary of Aquatic Features Identified

Analysis Area	Identified Aquatic Features			Total
	Breeding Habitat	Low Quality Breeding Habitat	Non-Breeding Habitat	
Project Study Area	0	0	4	4
Assessment Area[1]	40	5	5	50
TOTAL	**40**	**5**	**9**	**54**

Notes:
[1] Assessment area consists of a 1-mile buffer around the Project study area. The number of aquatic features represented in this table within the assessment area exclude those found within the Project study area.

4.3.1.1 Breeding

None of the four aquatic features identified in the Project study area provide the essential components of CRLF breeding habitat (see Table 4-2, Figure 4-2, and Sub-exhibit 1C2). Outside of the Project study area, but within the assessment area, 40 of the 50 identified aquatic features provide essential components necessary for CRLF breeding (Table 4-2) based on either field observations or a review of available aerial imagery (e.g., Google Earth) across multiple years and seasons. The size of these features ranges from 0.02 acre up to 1.9 acres (Sub-exhibit 1C2). They appear to have sufficient water depths to provide potential CRLF breeding habitat. They also appear to hold water long enough for CRLF larvae to reach metamorphosis (i.e., generally until June and July). These features also supported emergent vegetation for egg attachment substrate. Plant species observed at accessible ponds during field surveys consisted of hardstem bulrush (*Schoenoplectus acutus*), salt grass (*Distichlis spicata*), curly dock (*Rumex crispus*), broadleaf cattail (*Typha latifolia*), spike rush (*Eleocharis macrostachya*), and spiny cocklebur (*Xanthium spinosum*). Overhanging vegetation observed

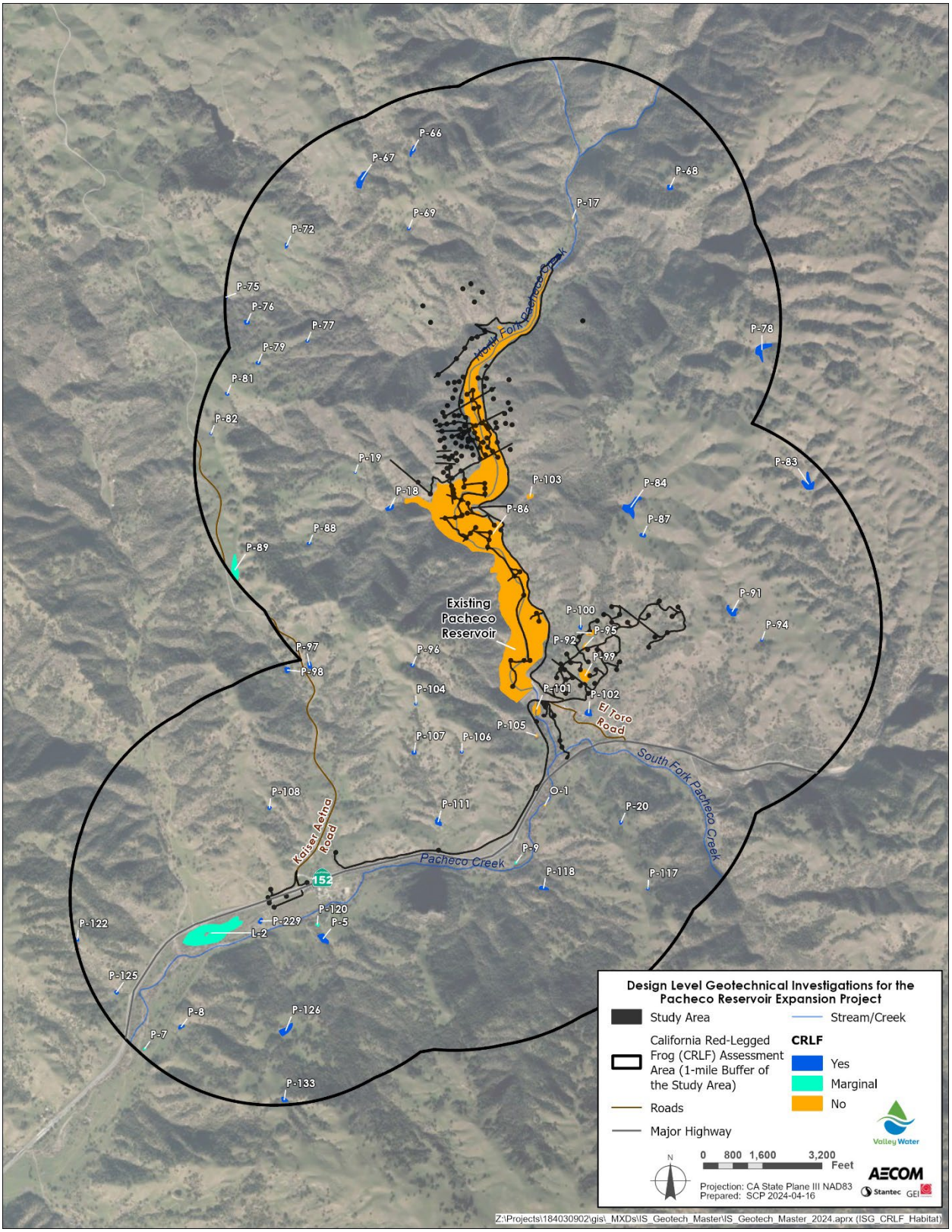


Figure 4-2. California Red-legged Frog Aquatic Habitats within Assessment Area

around these ponds included red willow (*Salix laevigata*), coast live oak (*Quercus agrifolia*) and mule fat (*Baccharis salicifolia*). Animal species observed at these ponds included Pacific treefrog (*Hyla regilla*), northwestern pond turtle (*Actinemys marmorata*), American bullfrog, unidentifiable fish species and numerous aquatic invertebrates such as water striders (*Gerridae*) and water boatman (*Corixidae*).

There are no aquatic features within the Project study area that provide low-quality CRLF breeding habitat (Table 4-2). Outside of the Project study area, but within the assessment area, 5 out of 40 features provide marginal habitat (see Table 4-2, Figure 4-2, and Sub-exhibit 1C2). These features range from approximately 0.03 acre to approximately 12.25 acres in size and appear to only provide sufficient hydroperiod to support CRLF breeding during years with above average precipitation. The marginal features that were observed during field surveys found that they either contained no vegetation or sparse vegetation, along with invasive predators/competitors (e.g., American bullfrog, sunfish) which negatively affected habitat quality.

4.3.1.2 Nonbreeding

The remaining four aquatic features identified in the Project study area are considered nonbreeding aquatic habitat for CRLF (Table 4-2), given they lack sufficient hydroperiod to support the species, are too large (e.g., the existing Pacheco Reservoir), or did not provide suitable upland habitat within the adjacent vicinity. Within the assessment area, five aquatic features do not provide breeding habitat. The characteristics of both the marginal breeding habitat and those aquatic features that do not provide breeding habitat are also similar to those identified above within the Project study area (i.e., insufficient hydroperiod and also containing a lack of vegetation, and/or nonnative, and invasive predators/competitors). A complete list of all aquatic features, their location (i.e., inside the Project study area or within the assessment area), habitat type, size, and suitability ranking are provided in Sub-exhibit 1C2.

4.3.2 Summer/Upland and Dispersal Habitats

Summer/upland habitat within the Project study area and adjacent assessment area was identified as potential suitable upland refugia for CRLF during the species nonbreeding period (i.e., approximately May through mid-November). While CRLF have been documented to cover/disperse distances between 0.25 mile to more than 2 miles (USFWS 2005; Tartarian 2008), for the purposes of this exhibit, summer/upland habitat consists of areas within one mile of potential breeding sites that stay cool and moist throughout the summer (Fellers 2005), which is also consistent with the definition of assessment area provided in the USFWS revised guidance for CRLF site assessments (USFWS 2005). Summer habitats must provide sufficient moisture to allow CRLF to survive throughout the nonbreeding season (i.e., up to 11 months) and sufficient cover to allow thermal regulation and provide protection from predators, (Fellers and Kleeman 2007). CRLF have been known to seek cover in summer habitats in areas such as small mammal burrows, leaf litter, or downed woody debris (e.g., fallen/decomposing trees). Vegetation communities within the Project study area and adjacent assessment area identified as suitable summer habitat consist primarily of annual grassland, woodland habitats, riparian, and scrub/shrub habitats along with aquatic features that do not provide suitable breeding habitat.

Dispersal habitat is typically associated with vegetation communities that CRLF will travel through between the breeding and nonbreeding seasons (i.e., grasslands, woodlands, riparian, or seeps/springs). This includes aquatic features that may not be suitable for breeding but may provide foraging habitat or refugia for dispersing CRLF. CRLF often disperse from their breeding habitat to forage and seek summer habitat if water is not available. CRLF may also take refuge in small mammal burrows and other refugia (e.g., leaf litter) up to approximately 328 feet (100

meters) from the water any time of the year and can be encountered in smaller, even ephemeral bodies of water in a variety of upland habitats (USFWS 2005). During periods of wet weather, starting with the first rains of fall, some CRLF disperse from upland habitats toward breeding habitat.

Table 4-3 provides approximate acreages of the land cover types within the Project study area that may provide potential upland and dispersal habitats for CRLF. The *Terrestrial Vegetation Community Mapping Technical Memorandum* prepared for the PREP planning process, provides characterizations for the 10 land cover types mapped within the Project study area. In addition to the terrestrial vegetation community types identified in Table 4-3, all aquatic features meeting CRLF breeding habitat criteria for essential and marginal habitat, as well as aquatic features that did not meet the criteria for breeding were considered to meet the summer CRLF habitat criteria.

Table 4-3. California Red-Legged Frog Summer and Upland/Dispersal Land Cover Types within the Project Study Area

Land Cover Type	Acres Within Project Study Area
Blue oak woodland	9.1
California annual grassland	14.8
Coast live oak forest and woodland	7.7
Mixed evergreen forest	0.0
Mixed riparian forest and woodland	0.1
Non-serpentine native grassland	1.5
Northern coastal scrub/Diablan sage scrub	4.9
Northern mixed chaparral/chamise chaparral	0.7
Valley oak woodland	2.4
Willow riparian forest and scrub	0.1
Total Acreage	**41.3**

Potentially suitable upland and dispersal habitat for CRLF within the assessment area, but outside of the Project study area, was assessed using the Santa Clara Valley Habitat Plan (SCVHP) land cover data (Santa Clara Valley Habitat Agency 2017). These upland areas consist of 11 different land cover types and total approximately 9,131 acres (Table 4-4).

Table 4-4. Suitable California Red-legged Frog Summer and Upland/Dispersal Land Cover Types within Assessment Area

Land Cover Type	Acres Within the Assessment Area
Blue Oak Woodland	451.2
California Annual Grassland	2021.6
Central California Sycamore Alluvial Woodland	132.0
Foothill Pine - Oak Woodland	42.9
Mixed Oak Woodland and Forest	5315.2
Mixed Riparian Forest and Woodland	70.1

Land Cover Type	Acres Within the Assessment Area
Mixed Serpentine Chaparral	180.5
Northern Coastal Scrub / Diablan Sage Scrub	3.6
Northern Mixed Chaparral / Chamise Chaparral	481.2
Valley Oak Woodland	388.8
Willow Riparian Forest and Scrub	44.1
Total Acreage	**9,131.3**

Chapter 5. References

CAS (California Academy of Sciences). 2023. Library Indexes and Databases. Available at: <https://www.calacademy.org/library-indexes-and-databases>. Accessed on March 2023.

CDFW (California Department of Fish and Wildlife). 2023. California Natural Diversity Database (CNDDB) RareFind 5. California Department of Fish and Wildlife. Records search within 1-mile, including the Mustang Peak, Pacheco Peak, Three Sisters, San Felipe, Mississippi Creek, and Pacheco Pass USGS 7.5-minute quadrangles. Sacramento, CA: California Department of Fish and Wildlife. Available at: <https://wildlife.ca.gov/Data/CNDDB/Maps-and-Data>. Accessed on September 25, 2023.

Fellers, G.M. 2005. *Rana draytonii* Baird and Girard 1852, California red-legged frog. In *Amphibian declines: The conservation status of United States species, Vol. 2: Species accounts*, edited by M. Lannoo. Berkeley, California: University of California Press. pp. 552–554.

Fellers, G.M. and P.M. Kleeman. 2007. California red-legged frog (*Rana draytonii*) movement and habitat use: implications for conservation. Journal of Herpetology, 41(2): pp. 276–286.

iNaturalist. 2023. California Red-legged Frog Observations. Available at: <https://www.inaturalist.org/observations?place_id=any&taxon_id=67016>. Accessed on March 2023.

Jennings, M.R. and M.P. Hayes. 1994. Amphibian and reptile species of special concern in California. Final report submitted to the California Department of Fish and Game, Inland Fisheries Division, Rancho Cordova, CA. Contract Number 8023.

Miller, K.J., A. Willy, S. Larsen, and S. Morey. 1996. Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the California Red-legged Frog. Federal Register: Vol. 61, No. 101.

Moyle, Peter B. 1973. Effects of introduced bullfrogs, Rana catesbeiana, on the native frogs of the San Joaquin Valley, California. Copeia 1973: pp. 18–22.

Olberding Environmental. 2020. Cedar Creek Property – Pond Survey Results – Santa Clara County. January 31, 2020.

Rathbun, G.B., M.R. Jennings, T.G. Murphey, and N.R. Siepel. 1993. Status and ecology of sensitive aquatic vertebrates in lower San Simeon and Pico Creeks, San Luis Obispo County, CA. National Ecology Research Center, Piedras Blancas Research Station, San Simeon, CA. Cooperative Agreement 14-16-009-91-1909.

Stebbins, R.C. and S.M. McGinnis. 2012. A Field Guide to Amphibians and Reptiles of California. University of California Press, Berkeley, USA.

Tartarian, P.J. 2008. Movement Patterns of California Red-legged Frogs (*Rana draytonii*) in an Inland California Environment. Herpetological Conservation and Biology 3(2): pp. 155–169.

USFWS (U.S. Fish and Wildlife Service). 1996. Endangered and threatened wildlife and plants; determination of threatened status for the California red-legged frog. Final rule. Federal Register, Vol. 61 No. 101: pp. 25813-25833. May 23, 1996.

_____. 2002. Recovery Plan for the California red-legged Frog (Rana aurora draytonii). USFWS, Portland, Oregon. viii + 173 pp.

_____. 2005. *Revised Guidance on Site Assessments and Field Surveys for the California Red-legged Frog*. Available at: <http://www.fws.gov/sacramento/es/Survey-Protocols-Guidelines/Documents/crf_survey_guidance_aug2005.pdf>. Accessed on March 20, 2020.

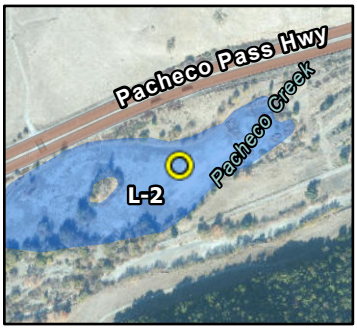
_____. 2010. Endangered and Threatened Wildlife and Plants; Revised Designation of Critical Habitat for the California Red-Legged Frog; Final Rule. Federal Register Volume 75, Number 51. 50 CFR Part 17. March 17, 2010. Available at: https://www.govinfo.gov/content/pkg/FR-2010-03-17/pdf/2010-4656.pdf#page=2 Accessed on August 3, 2020.

_____.2017. Species Information, California Red-Legged Frog. Sacramento Fish and Wildlife Office. Available at: <https://www.fws.gov/sacramento/es_species/Accounts/Amphibians-Reptiles/ca_red_legged_frog/>. Accessed on March 20, 2020.

_____. 2023. USFWS Designated Critical Habitat for California red-legged frog. USFWS Environmental Conservation Online System. Available at: <https://ecos.fws.gov/ecp/>. Accessed on September 2023.

Sub-exhibit 1C1 – CRLF Habitat Site Assessment Data Sheets

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **9-21-2022**

Biologist(s): **Nicolette Murphey, Laura Butler, Meghan Oats**

Is the site within the current or historic range of CTS or CRLF? **Yes**

Are there known records of CTS or CRLF within 1 mile (1.6km) of the site? **No**

POND

Label: **L-2**

Pond Size (acre): **12.246**

Pond Depth (feet): **3ft**

Is the Pond Perennial or Ephemeral? **Ephemeral**

If Ephemeral, when does it go dry? **9-21-2022**

Pond Vegetation: **Emergent veg on east side, willows, cattails.**

Pond Substrate: **No Data**

STREAM

Label: **N/A**

Stream Bank Full Width (feet): **N/A**

Stream Bank Full Depth (feet): **N/A**

Stream Gradient: **N/A**

Are there pools? **N/A**

Yes? Size: **N/A** Yes? Depth: **N/A**

Is the Stream Perennial or Ephemeral? **N/A**

If Ephemeral, when does it go dry? **N/A**

Stream Vegetation: **N/A**

Stream Substrate: **N/A**

Characterize non-stream Habitat: **N/A**

Stream Bank Description: **N/A**

Other aquatic habitat characteristics, species observations, drawings, or comments:

Possible breeding pond for CRLF and/or CTS if/when wet. Should revisit in spring.

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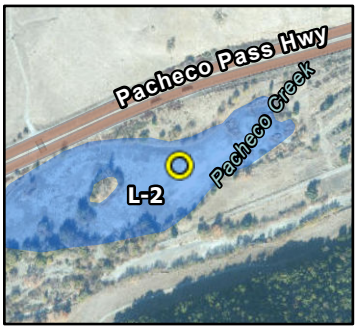


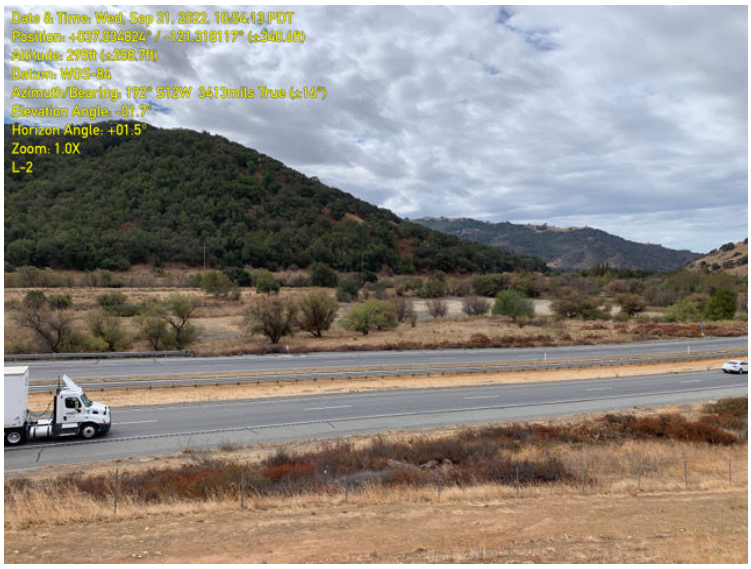
Date of Site Assessment: **9-21-2022**

Biologist(s): **Nicolette Murphey, Laura Butler, Meghan Oats**

Pond Label: **L-2**

Stream Label: **N/A**

PHOTOS



N/A

N/A

N/A

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **9-21-2022**

Biologist(s): **Nicolette Murphey, Laura Butler, Meghan Oats**

Is the site within the current or historic range of CTS or CRLF? **Yes**

Are there known records of CTS or CRLF within 1 mile (1.6km) of the site?

POND

Label: **Un-mapped 1**

Pond Size (acre): **Not Yet Calcualted**

Pond Depth (feet): **2ft**

Is the Pond Perennial or Ephemeral? **Ephemeral**

If Ephemeral, when does it go dry? **9-21-2022**

Pond Vegetation: **Grass**

Pond Substrate: **None**

STREAM

Label: **N/A**

Stream Bank Full Width (feet): **N/A**

Stream Bank Full Depth (feet): **N/A**

Stream Gradient: **N/A**

Are there pools? **N/A**

Yes? Size: **N/A** Yes? Depth: **N/A**

Is the Stream Perennial or Ephemeral? **N/A**

If Ephemeral, when does it go dry? **N/A**

Stream Vegetation: **N/A**

Stream Substrate: **N/A**

Characterize non-stream Habitat: **N/A**

Stream Bank Description: **N/A**

Other aquatic habitat characteristics, species observations, drawings, or comments:

Dry pool at bottom of ephemeral drainage used by cattle. CRLF/CTS may use when wet. CA ground squirrel burrows present nearby.

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CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **9-21-2022**

Biologist(s): **Nicolette Murphey, Laura Butler, Meghan Oats**

Pond Label: **Un-mapped 1**

Stream Label: **N/A**

PHOTOS



N/A

N/A

N/A

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **9-21-2022**

Biologist(s): **Laura Butler, Nicolette Murphey, Meghan Oats**

Is the site within the current or historic range of CTS or CRLF? **Yes**

Are there known records of CTS or CRLF within 1 mile (1.6km) of the site?

POND

Label: **P-111**

Pond Size (acre): **0.415**

Pond Depth (feet): **Unknown**

Is the Pond Perennial or Ephemeral? **Perennial**

If Ephemeral, when does it go dry? **N/A**

Pond Vegetation: **Bare/No Veg**

Pond Substrate: **No Data**

STREAM

Label: **N/A**

Stream Bank Full Width (feet): **N/A**

Stream Bank Full Depth (feet): **N/A**

Stream Gradient: **N/A**

Are there pools? **N/A**

Yes? Size: **N/A** Yes? Depth: **N/A**

Is the Stream Perennial or Ephemeral? **N/A**

If Ephemeral, when does it go dry? **N/A**

Stream Vegetation: **N/A**

Stream Substrate: **N/A**

Characterize non-stream Habitat: **N/A**

Stream Bank Description: **N/A**

Other aquatic habitat characteristics, species observations, drawings, or comments:

Possibly stock pond, standing water in pond

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CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **9-21-2022**

Biologist(s): **Laura Butler, Nicolette Murphey, Meghan Oats**

Pond Label: **P-111**

Stream Label: **N/A**

PHOTOS



N/A

N/A

N/A

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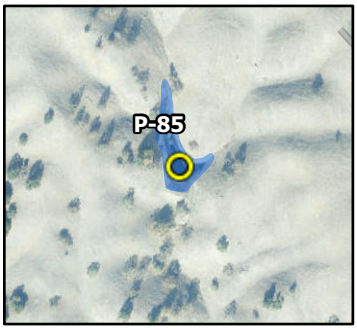
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **9-23-2022**

Biologist(s): **Nicolette Murphey, Laura Butler, Meghan Oats**

Is the site within the current or historic range of CTS or CRLF? **Yes**

Are there known records of CTS or CRLF within 1 mile (1.6km) of the site?

POND

Label: **P-85**

Pond Size (acre): **1.106**

Pond Depth (feet): **Unknown**

Is the Pond Perennial or Ephemeral? **Perennial**

If Ephemeral, when does it go dry? **N/A**

Pond Vegetation: **No overhanging veg. Main veg is grasses and water smartweed. Water primrose, pond weed, and other underwater veg in pond.**

Pond Substrate: **Rocks**

STREAM

Label: **N/A**

Stream Bank Full Width (feet): **N/A**

Stream Bank Full Depth (feet): **N/A**

Stream Gradient: **N/A**

Are there pools? **N/A**

Yes? Size: **N/A** Yes? Depth: **N/A**

Is the Stream Perennial or Ephemeral? **N/A**

If Ephemeral, when does it go dry? **N/A**

Stream Vegetation: **N/A**

Stream Substrate: **N/A**

Characterize non-stream Habitat: **N/A**

Stream Bank Description: **N/A**

Other aquatic habitat characteristics, species observations, drawings, or comments:

Some fish in pond. Makes it rather unsuitable breeding habitat, but breeding could occur. Adult (CTS/CRLF) could be present in upland and CRLF may use site for foraging, basking, or resting. CA ground squirrel burrows present that provide refuge.

Pacheco Reservoir Expansion Project
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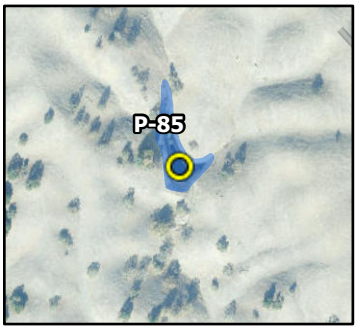


Date of Site Assessment: **9-23-2022**

Biologist(s): **Nicolette Murphey, Laura Butler, Meghan Oats**

Pond Label: **P-85**

Stream Label: **N/A**

PHOTOS

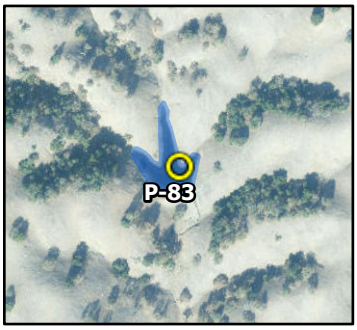






N/A

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **9-23-2022**

Biologist(s): **Laura Butler, Nicolette Murphey, Meghan Oats**

Is the site within the current or historic range of CTS or CRLF? **Yes**

Are there known records of CTS or CRLF within 1 mile (1.6km) of the site?

POND

Label: **P-83**

Pond Size (acre): **1.275**

Pond Depth (feet): **Unknown**

Is the Pond Perennial or Ephemeral? **Perennial**

If Ephemeral, when does it go dry? **N/A**

Pond Vegetation: **No emergent or overhanging vegetation**

Pond Substrate: **No Data**

STREAM

Label: **N/A**

Stream Bank Full Width (feet): **N/A**

Stream Bank Full Depth (feet): **N/A**

Stream Gradient: **N/A**

Are there pools? **N/A**

Yes? Size: **N/A** Yes? Depth: **N/A**

Is the Stream Perennial or Ephemeral? **N/A**

If Ephemeral, when does it go dry? **N/A**

Stream Vegetation: **N/A**

Stream Substrate: **N/A**

Characterize non-stream Habitat: **N/A**

Stream Bank Description: **N/A**

Other aquatic habitat characteristics, species observations, drawings, or comments:

Standing water present

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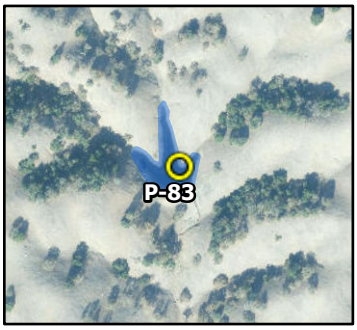
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **9-23-2022**

Biologist(s): **Laura Butler, Nicolette Murphey, Meghan Oats**

Pond Label: **P-83**

Stream Label: **N/A**

PHOTOS

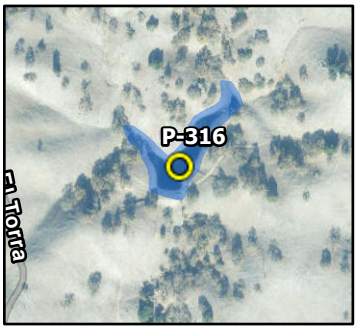




N/A

N/A

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **9-26-2022**

Biologist(s): **Nicolette Murphey, Sheryl Creer**

Is the site within the current or historic range of CTS or CRLF? **Yes**

Are there known records of CTS or CRLF within 1 mile (1.6km) of the site?

POND

Label: **P-316**

Pond Size (acre): **2.111**

Pond Depth (feet): **Unknown**

Is the Pond Perennial or Ephemeral? **Perennial**

If Ephemeral, when does it go dry? **N/A**

Pond Vegetation: **No overhanging veg. Dominant species are grasses and water smartweed, many patches of pond weed (potamogetom nodosus) and other**

Pond Substrate: **Rocks, logs.**

STREAM

Label: **N/A**

Stream Bank Full Width (feet): **N/A**

Stream Bank Full Depth (feet): **N/A**

Stream Gradient: **N/A**

Are there pools? **N/A**

Yes? Size: **N/A** Yes? Depth: **N/A**

Is the Stream Perennial or Ephemeral? **N/A**

If Ephemeral, when does it go dry? **N/A**

Stream Vegetation: **N/A**

Stream Substrate: **N/A**

Characterize non-stream Habitat: **N/A**

Stream Bank Description: **N/A**

Other aquatic habitat characteristics, species observations, drawings, or comments:

Some fish in pond. Makes it somewhat unsuitable breeding habitat, but breeding could occur. Adult (CTS/CRLF) could be present in upland and CRLF may use site for foraging, basking, or resting. CA ground squirrel burrows provide areas for refuge. Large snag and branches provide refuge as well.

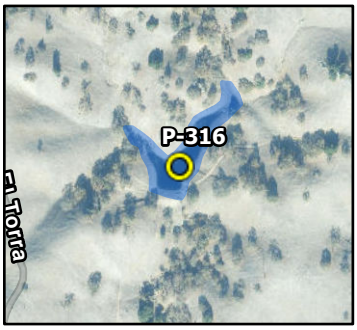
Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022

Date of Site Assessment: **9-26-2022**

Biologist(s): **Nicolette Murphey, Sheryl Creer**

Pond Label: **P-316**

Stream Label: **N/A**



PHOTOS





N/A

N/A

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **9-26-2022**

Biologist(s): **Nicolette Murphey, Sheryl Creer**

Is the site within the current or historic range of CTS or CRLF? **Yes**

Are there known records of CTS or CRLF within 1 mile (1.6km) of the site?

POND

Label: **P-310**

Pond Size (acre): **2.179**

Pond Depth (feet): **Unknown**

Is the Pond Perennial or Ephemeral? **Perennial**

If Ephemeral, when does it go dry? **N/A**

Pond Vegetation: **Grasses and oaks. In pond: Algae and pond weed.**

Pond Substrate: **Logs**

STREAM

Label: **N/A**

Stream Bank Full Width (feet): **N/A**

Stream Bank Full Depth (feet): **N/A**

Stream Gradient: **N/A**

Are there pools? **N/A**

Yes? Size: **N/A** Yes? Depth: **N/A**

Is the Stream Perennial or Ephemeral? **N/A**

If Ephemeral, when does it go dry? **N/A**

Stream Vegetation: **N/A**

Stream Substrate: **N/A**

Characterize non-stream Habitat: **N/A**

Stream Bank Description: **N/A**

Other aquatic habitat characteristics, species observations, drawings, or comments:

Small fish present, makes breeding habitat more unsuitable, but breeding could occur. Ca ground squirrel burrows present. CTS could be upland, CRLF could use pond for breeding, sunning, resting and foraging.

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **9-26-2022**

Biologist(s): **Nicolette Murphey, Sheryl Creer**

Pond Label: **P-310**

Stream Label: **N/A**

PHOTOS

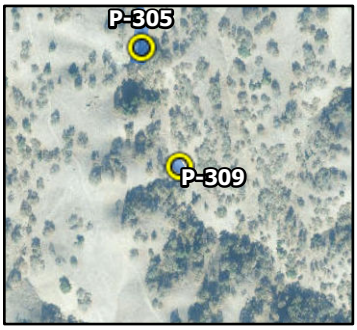






N/A

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **9-28-2022**

Biologist(s): **Nicolette Murphey, Sheryl Creer**

Is the site within the current or historic range of CTS or CRLF? **Yes**

Are there known records of CTS or CRLF within 1 mile (1.6km) of the site?

POND

Label: **P-309**

Pond Size (acre): **0.03**

Pond Depth (feet): **1-2 ft**

Is the Pond Perennial or Ephemeral? **Ephemeral**

If Ephemeral, when does it go dry? **9-28-2022**

Pond Vegetation: **Grasses**

Pond Substrate: **No Data**

STREAM

Label: **N/A**

Stream Bank Full Width (feet): **N/A**

Stream Bank Full Depth (feet): **N/A**

Stream Gradient: **N/A**

Are there pools? **N/A**

Yes? Size: **N/A** Yes? Depth: **N/A**

Is the Stream Perennial or Ephemeral? **N/A**

If Ephemeral, when does it go dry? **N/A**

Stream Vegetation: **N/A**

Stream Substrate: **N/A**

Characterize non-stream Habitat: **N/A**

Stream Bank Description: **N/A**

Other aquatic habitat characteristics, species observations, drawings, or comments:

Evaluated from hilltop. Small dry pool along drainage. Would need to check in spring to assess habitat suitability for CTS/CRLF.

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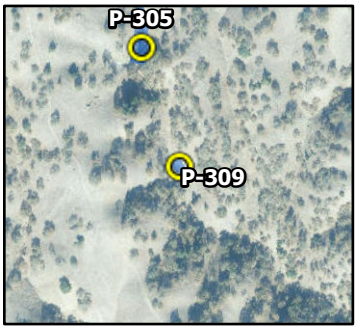
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **9-28-2022**

Biologist(s): **Nicolette Murphey, Sheryl Creer**

Pond Label: **P-309**

Stream Label: **N/A**

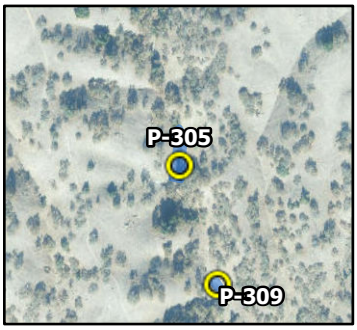
PHOTOS

N/A

N/A

N/A

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **9-28-2022**

Biologist(s): **Nicolette Murphey, Sheryl Creer**

Is the site within the current or historic range of CTS or CRLF? **Yes**

Are there known records of CTS or CRLF within 1 mile (1.6km) of the site?

POND

Label: **P-305**

Pond Size (acre): **0.304**

Pond Depth (feet): **Unknown**

Is the Pond Perennial or Ephemeral? **Perennial**

If Ephemeral, when does it go dry? **N/A**

Pond Vegetation: **No overhanging veg, looks like there may be pond weed and other aquatic plants in pond.**

Pond Substrate: **Rocks and sticks**

STREAM

Label: **N/A**

Stream Bank Full Width (feet): **N/A**

Stream Bank Full Depth (feet): **N/A**

Stream Gradient: **N/A**

Are there pools? **N/A**

Yes? Size: **N/A** Yes? Depth: **N/A**

Is the Stream Perennial or Ephemeral? **N/A**

If Ephemeral, when does it go dry? **N/A**

Stream Vegetation: **N/A**

Stream Substrate: **N/A**

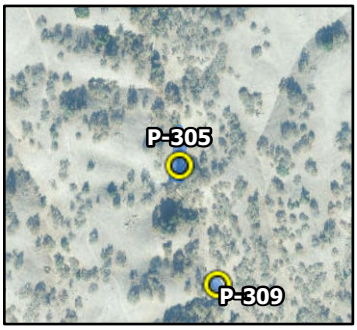
Characterize non-stream Habitat: **N/A**

Stream Bank Description: **N/A**

Other aquatic habitat characteristics, species observations, drawings, or comments:

Evaluated from atop the hill, fish presence unknown. Could be suitable breeding CTS/CRLF) if not. Even if fish are present, would be suitable foraging, basking, and resting habitat for CRLF. CA ground squirrel burrows present as refuge.

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **9-28-2022**

Biologist(s): **Nicolette Murphey, Sheryl Creer**

Pond Label: **P-305**

Stream Label: **N/A**

PHOTOS



N/A

N/A

N/A

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **9-28-2022**

Biologist(s): **Nicolette Murphey, Sheryl Creer**

Is the site within the current or historic range of CTS or CRLF? **Yes**

Are there known records of CTS or CRLF within 1 mile (1.6km) of the site?

POND

Label: **P-301**

Pond Size (acre): **1.113**

Pond Depth (feet): **Unknown**

Is the Pond Perennial or Ephemeral? **Perennial**

If Ephemeral, when does it go dry? **N/A**

Pond Vegetation: **No vegetation. Grasses around outer edges.**

Pond Substrate: **Rocks**

STREAM

Label: **N/A**

Stream Bank Full Width (feet): **N/A**

Stream Bank Full Depth (feet): **N/A**

Stream Gradient: **N/A**

Are there pools? **N/A**

Yes? Size: **N/A** Yes? Depth: **N/A**

Is the Stream Perennial or Ephemeral? **N/A**

If Ephemeral, when does it go dry? **N/A**

Stream Vegetation: **N/A**

Stream Substrate: **N/A**

Characterize non-stream Habitat: **N/A**

Stream Bank Description: **N/A**

Other aquatic habitat characteristics, species observations, drawings, or comments:

Viewed from hilltop. Presence of fish unknown. Otherwise suitable habitat for CTS/CRLF. CA ground squirrel burrows present.

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **9-28-2022**

Biologist(s): **Nicolette Murphey, Sheryl Creer**

Pond Label: **P-301**

Stream Label: **N/A**

PHOTOS

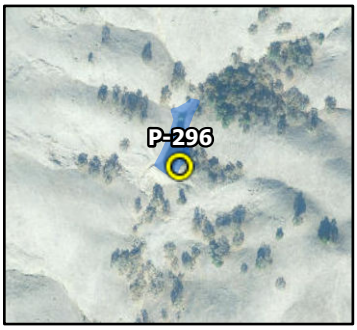




N/A

N/A

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **9-28-2022**

Biologist(s): **Nicolette Murphey, Sheryl Creer**

Is the site within the current or historic range of CTS or CRLF? **Yes**

Are there known records of CTS or CRLF within 1 mile (1.6km) of the site? **Yes**

POND

Label: **P-296**

Pond Size (acre): **0.705**

Pond Depth (feet): **Unknown**

Is the Pond Perennial or Ephemeral? **No Data**

If Ephemeral, when does it go dry? **N/A**

Pond Vegetation: **Grasses and oaks. No overhanging veg. Too far to ID veg in pond, most likely pond weed.**

Pond Substrate: **No Data**

STREAM

Label: **N/A**

Stream Bank Full Width (feet): **N/A**

Stream Bank Full Depth (feet): **N/A**

Stream Gradient: **N/A**

Are there pools? **N/A**

Yes? Size: **N/A** Yes? Depth: **N/A**

Is the Stream Perennial or Ephemeral? **N/A**

If Ephemeral, when does it go dry? **N/A**

Stream Vegetation: **N/A**

Stream Substrate: **N/A**

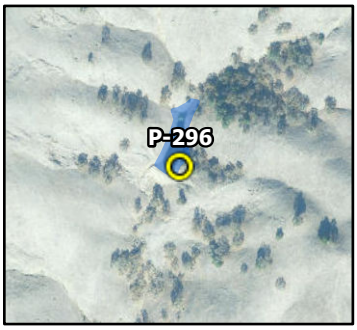
Characterize non-stream Habitat: **N/A**

Stream Bank Description: **N/A**

Other aquatic habitat characteristics, species observations, drawings, or comments:

Viewed from far hilltop. Could not see if there was veg in pond. Could not see all areas of pond. CA ground squirrel burrows present. Unknown fish presence, otherwise suitable habitat for CRLF/CTS.

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **9-28-2022**

Biologist(s): **Nicolette Murphey, Sheryl Creer**

Pond Label: **P-296**

Stream Label: **N/A**

PHOTOS

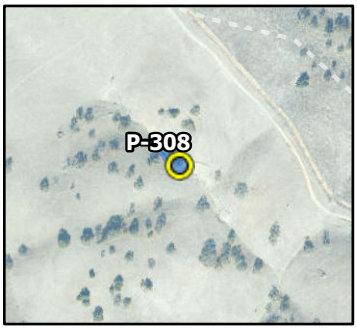






N/A

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **9-29-2022**

Biologist(s): **Nicolette Murphey, Christina Rodriguez**

Is the site within the current or historic range of CTS or CRLF? **Yes**

Are there known records of CTS or CRLF within 1 mile (1.6km) of the site?

POND

Label: **P-308**

Pond Size (acre): **0.289**

Pond Depth (feet): **Unknown**

Is the Pond Perennial or Ephemeral? **Perennial**

If Ephemeral, when does it go dry? **N/A**

Pond Vegetation: **Emergent veg (cattails). Other veg grasses, juncus, pond weed, and algae**

Pond Substrate: **Rocks**

STREAM

Label: **N/A**

Stream Bank Full Width (feet): **N/A**

Stream Bank Full Depth (feet): **N/A**

Stream Gradient: **N/A**

Are there pools? **N/A**

Yes? Size: **N/A** Yes? Depth: **N/A**

Is the Stream Perennial or Ephemeral? **N/A**

If Ephemeral, when does it go dry? **N/A**

Stream Vegetation: **N/A**

Stream Substrate: **N/A**

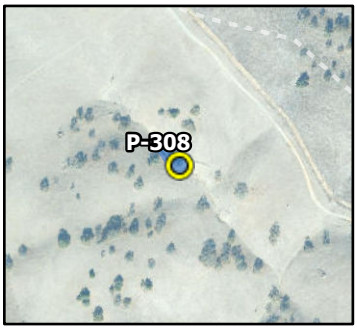
Characterize non-stream Habitat: **N/A**

Stream Bank Description: **N/A**

Other aquatic habitat characteristics, species observations, drawings, or comments:

Saw a few plops into the water near bulrush when approaching pond. Could not locate frogs once spooked. Would be best to resurvey at night to determine species. Ideal CRLF habitat for breeding, basking, foraging, and resting. CA ground squirrel burrows present, providing refuge for possible CTS.

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



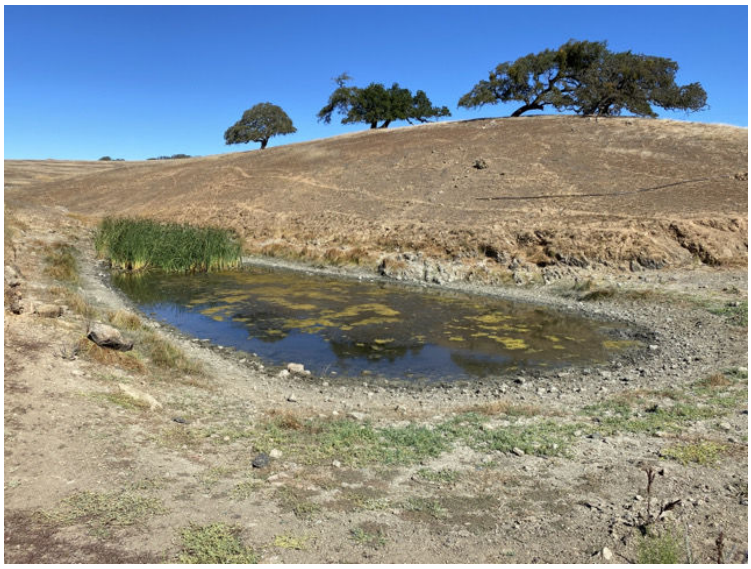
Date of Site Assessment: **9-29-2022**

Biologist(s): **Nicolette Murphey, Christina Rodriguez**

Pond Label: **P-308**

Stream Label: **N/A**

PHOTOS

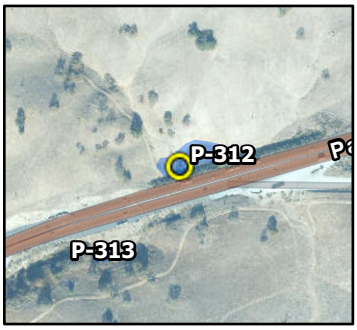


N/A

N/A

N/A

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **9-29-2022**

Biologist(s): **Nicolette Murphey, Christina Rodriguez**

Is the site within the current or historic range of CTS or CRLF? **Yes**

Are there known records of CTS or CRLF within 1 mile (1.6km) of the site?

POND

Label: **P-312**

Pond Size (acre): **0.666**

Pond Depth (feet): **2-3ft**

Is the Pond Perennial or Ephemeral? **Ephemeral**

If Ephemeral, when does it go dry? **9-29-2022**

Pond Vegetation: **Dead wetland veg, salt grass, buckwheat scrub and oaks on south side along highway.**

Pond Substrate: **Rocks**

STREAM

Label: **N/A**

Stream Bank Full Width (feet): **N/A**

Stream Bank Full Depth (feet): **N/A**

Stream Gradient: **N/A**

Are there pools? **N/A**

Yes? Size: **N/A** Yes? Depth: **N/A**

Is the Stream Perennial or Ephemeral? **N/A**

If Ephemeral, when does it go dry? **N/A**

Stream Vegetation: **N/A**

Stream Substrate: **N/A**

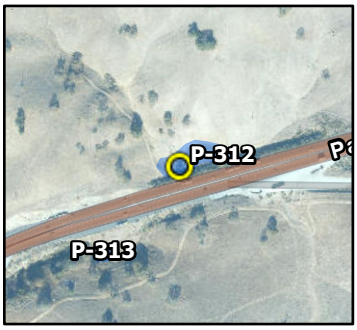
Characterize non-stream Habitat: **N/A**

Stream Bank Description: **N/A**

Other aquatic habitat characteristics, species observations, drawings, or comments:

Could be CRLF/CTS habitats when wet.

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **9-29-2022**

Biologist(s): **Nicolette Murphey, Christina Rodriguez**

Pond Label: **P-312**

Stream Label: **N/A**

PHOTOS

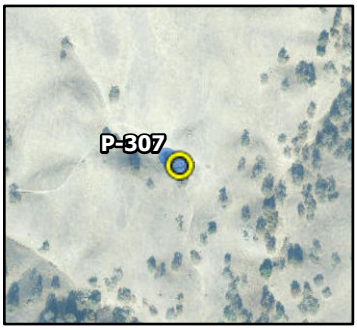


N/A

N/A

N/A

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **9-30-2022**

Biologist(s): **Nicolette Murphey, Christina Rodriguez**

Is the site within the current or historic range of CTS or CRLF? **Yes**

Are there known records of CTS or CRLF within 1 mile (1.6km) of the site?

POND

Label: **P-307**

Pond Size (acre): **0.223**

Pond Depth (feet): **Unknown**

Is the Pond Perennial or Ephemeral? **Perennial**

If Ephemeral, when does it go dry? **N/A**

Pond Vegetation: **No overhanging veg, emergent veg present. Cattails (Typha sp.), water smartweed (Persicaria amphibia), pond weed, duck weed.**

Pond Substrate: **Rocks, dead veg.**

STREAM

Label: **N/A**

Stream Bank Full Width (feet): **N/A**

Stream Bank Full Depth (feet): **N/A**

Stream Gradient: **N/A**

Are there pools? **N/A**

Yes? Size: **N/A** Yes? Depth: **N/A**

Is the Stream Perennial or Ephemeral? **N/A**

If Ephemeral, when does it go dry? **N/A**

Stream Vegetation: **N/A**

Stream Substrate: **N/A**

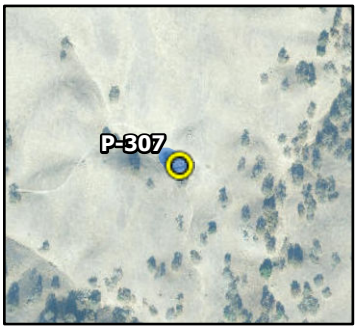
Characterize non-stream Habitat: **N/A**

Stream Bank Description: **N/A**

Other aquatic habitat characteristics, species observations, drawings, or comments:

Positive for CRLF (see photo). May be too shallow/warm for fish to survive, making it ideal breeding habitat for CRLF/CTS. CA ground squirrel burrows present to provide refuge.

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **9-30-2022**

Biologist(s): **Nicolette Murphey, Christina Rodriguez**

Pond Label: **P-307**

Stream Label: **N/A**

PHOTOS







N/A

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **9-30-2022**

Biologist(s): **Nicolette Murphey, Christina Rodriguez**

Is the site within the current or historic range of CTS or CRLF? **Yes**

Are there known records of CTS or CRLF within 1 mile (1.6km) of the site? **Yes**

POND

Label: **P-311**

Pond Size (acre): **1.265**

Pond Depth (feet): **Unknown**

Is the Pond Perennial or Ephemeral? **Perennial**

If Ephemeral, when does it go dry? **N/A**

Pond Vegetation: **Some overhanging veg (oaks) on South side of pond, emergent veg (cattails) on west side of pond. Juncus, water smartweed and grasses**

Pond Substrate: **Rocks, logs**

STREAM

Label: **N/A**

Stream Bank Full Width (feet): **N/A**

Stream Bank Full Depth (feet): **N/A**

Stream Gradient: **N/A**

Are there pools? **N/A**

Yes? Size: **N/A** Yes? Depth: **N/A**

Is the Stream Perennial or Ephemeral? **N/A**

If Ephemeral, when does it go dry? **N/A**

Stream Vegetation: **N/A**

Stream Substrate: **N/A**

Characterize non-stream Habitat: **N/A**

Stream Bank Description: **N/A**

Other aquatic habitat characteristics, species observations, drawings, or comments:

Saw a larger fish breach in pond, may not be suitable breeding habitat (CTS, CRLF) but breeding could occur. Suitable foraging, basking, and resting habitat for CRLF. CA ground squirrel burrows present provide refuge.

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **9-30-2022**

Biologist(s): **Nicolette Murphey, Christina Rodriguez**

Pond Label: **P-311**

Stream Label: **N/A**

PHOTOS

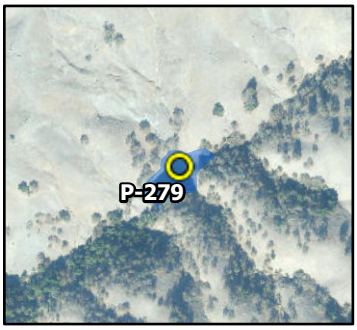


N/A

N/A

N/A

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **10-6-2022**

Biologist(s): **Brendan Cohen**

Is the site within the current or historic range of CTS or CRLF? **Yes**

Are there known records of CTS or CRLF within 1 mile (1.6km) of the site?

POND

Label: **P-279**

Pond Size (acre): **1.011**

Pond Depth (feet): **Unknown**

Is the Pond Perennial or Ephemeral? **Perennial**

If Ephemeral, when does it go dry? **N/A**

Pond Vegetation: **None visible**

Pond Substrate: **No Data**

STREAM

Label: **N/A**

Stream Bank Full Width (feet): **N/A**

Stream Bank Full Depth (feet): **N/A**

Stream Gradient: **N/A**

Are there pools? **N/A**

Yes? Size: **N/A** Yes? Depth: **N/A**

Is the Stream Perennial or Ephemeral? **N/A**

If Ephemeral, when does it go dry? **N/A**

Stream Vegetation: **N/A**

Stream Substrate: **N/A**

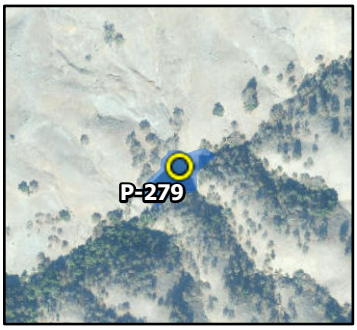
Characterize non-stream Habitat: **N/A**

Stream Bank Description: **N/A**

Other aquatic habitat characteristics, species observations, drawings, or comments:

Pond barely visible and only small piece visible. Has fairly high amount of water. No bank side vegetation visible. Nearby oak trees. Somewhat Rocky bank

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **10-6-2022**

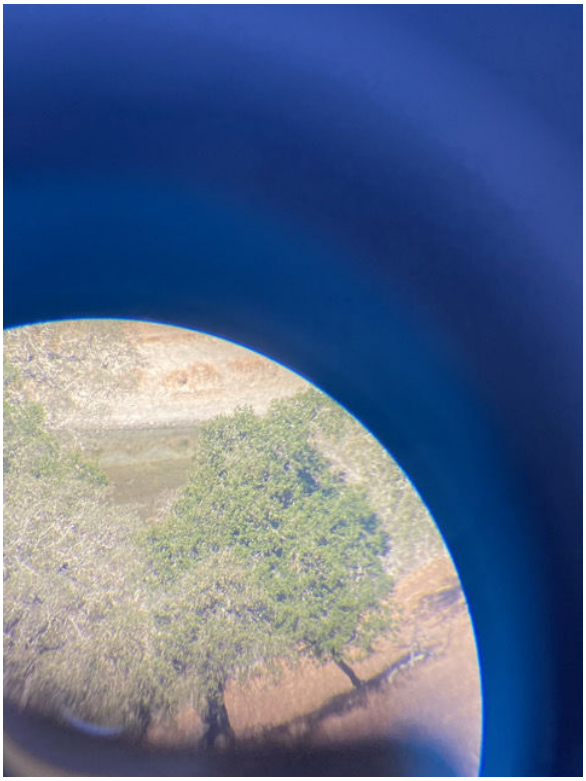
Biologist(s): **Brendan Cohen**

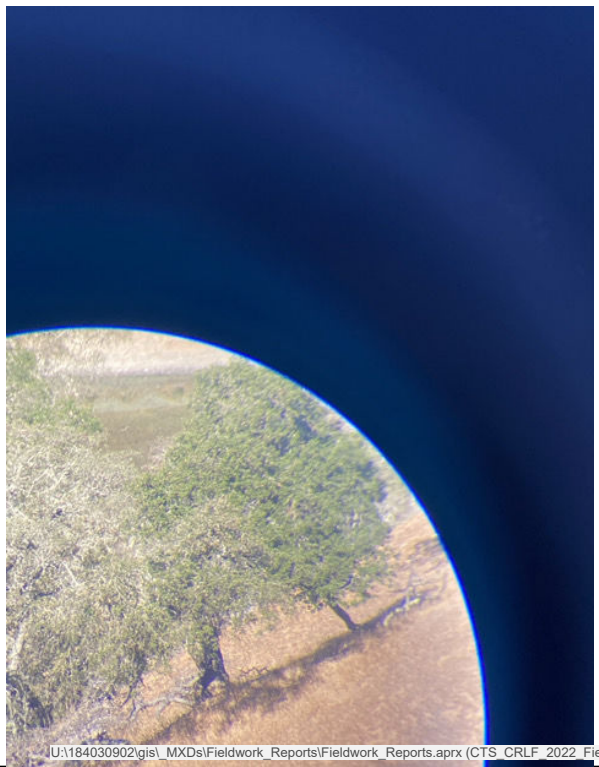
Pond Label: **P-279**

Stream Label: **N/A**

PHOTOS







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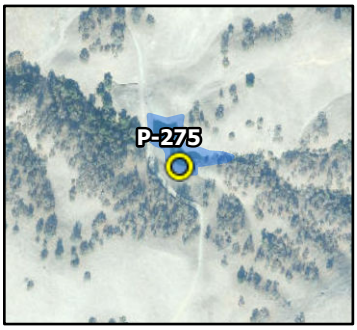
Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **10-6-2022**

Biologist(s): **Brendan Cohen**

Is the site within the current or historic range of CTS or CRLF? **Yes**

Are there known records of CTS or CRLF within 1 mile (1.6km) of the site?

POND

Label: **P-275**

Pond Size (acre): **1.065**

Pond Depth (feet): **Unknown**

Is the Pond Perennial or Ephemeral? **Perennial**

If Ephemeral, when does it go dry? **N/A**

Pond Vegetation: **None**

Pond Substrate: **Unknown**

STREAM

Label: **N/A**

Stream Bank Full Width (feet): **N/A**

Stream Bank Full Depth (feet): **N/A**

Stream Gradient: **N/A**

Are there pools? **N/A**

Yes? Size: **N/A** Yes? Depth: **N/A**

Is the Stream Perennial or Ephemeral? **N/A**

If Ephemeral, when does it go dry? **N/A**

Stream Vegetation: **None**

Stream Substrate: **N/A**

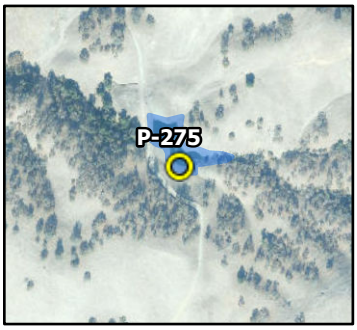
Characterize non-stream Habitat: **N/A**

Stream Bank Description: **None**

Other aquatic habitat characteristics, species observations, drawings, or comments:

Rectangular pond. No bank side or surface water vegetation seen. Rocky banks Exposed. Seems human constructed as it's rectangular. Fairly high water level

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **10-6-2022**

Biologist(s): **Brendan Cohen**

Pond Label: **P-275**

Stream Label: **N/A**

PHOTOS

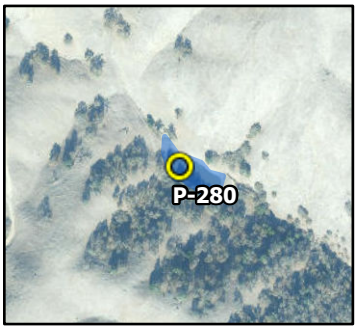




N/A

N/A

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **10-6-2022**

Biologist(s): **Brendan Cohen**

Is the site within the current or historic range of CTS or CRLF? **Yes**

Are there known records of CTS or CRLF within 1 mile (1.6km) of the site?

POND

Label: **P-280**

Pond Size (acre): **0.834**

Pond Depth (feet): **At least 8 inches**

Is the Pond Perennial or Ephemeral? **Perennial**

If Ephemeral, when does it go dry? **N/A**

Pond Vegetation: **None**

Pond Substrate: **Likely rocky**

STREAM

Label: **N/A**

Stream Bank Full Width (feet): **N/A**

Stream Bank Full Depth (feet): **N/A**

Stream Gradient: **N/A**

Are there pools? **N/A**

Yes? Size: **N/A** Yes? Depth: **N/A**

Is the Stream Perennial or Ephemeral? **Perennial**

If Ephemeral, when does it go dry? **N/A**

Stream Vegetation: **N/A**

Stream Substrate: **N/A**

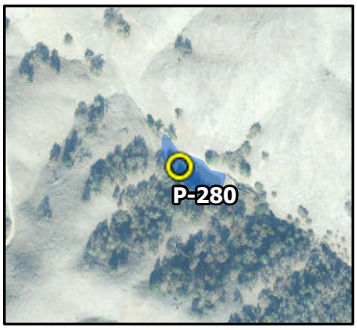
Characterize non-stream Habitat: **N/A**

Stream Bank Description: **N/A**

Other aquatic habitat characteristics, species observations, drawings, or comments:

At least 8 or 10 inches of water present. No bank side or surface water vegetation seen. Rocky banks. Water level seems fairly low to normal levels.

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **10-6-2022**

Biologist(s): **Brendan Cohen**

Pond Label: **P-280**

Stream Label: **N/A**

PHOTOS





N/A

N/A

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **10-7-2022**

Biologist(s): **Brendan Cohen**

Is the site within the current or historic range of CTS or CRLF?

Are there known records of CTS or CRLF within 1 mile (1.6km) of the site?

POND

Label: **P-306**

Pond Size (acre): **0.355**

Pond Depth (feet): **Unknown**

Is the Pond Perennial or Ephemeral? **Ephemeral**

If Ephemeral, when does it go dry? **10-7-2022**

Pond Vegetation: **Cockebur and some trichostema**

Pond Substrate: **Loamy/soil**

STREAM

Label: **N/A**

Stream Bank Full Width (feet): **N/A**

Stream Bank Full Depth (feet): **N/A**

Stream Gradient: **N/A**

Are there pools? **N/A**

Yes? Size: **N/A** Yes? Depth: **N/A**

Is the Stream Perennial or Ephemeral? **Ephemeral**

If Ephemeral, when does it go dry? **N/A**

Stream Vegetation: **N/A**

Stream Substrate: **N/A**

Characterize non-stream Habitat: **N/A**

Stream Bank Description: **N/A**

Other aquatic habitat characteristics, species observations, drawings, or comments:

No water at time of survey. Roughly 25% or so herbaceous vegetation cover. Cocklebur and some other herbs like trichostema . Water line indicators fairly high up on slope. See pics.

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **10-7-2022**

Biologist(s): **Brendan Cohen**

Pond Label: **P-306**

Stream Label: **N/A**

PHOTOS

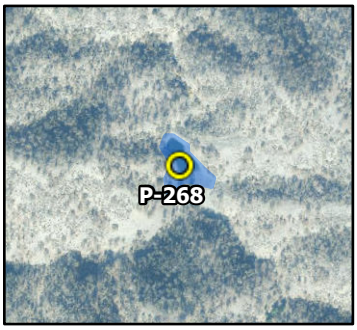








Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **10-10-2022**

Biologist(s): **David Tange**

Is the site within the current or historic range of CTS or CRLF? **Yes**

Are there known records of CTS or CRLF within 1 mile (1.6km) of the site?

POND

Label: **P-268**

Pond Size (acre): **0.855**

Pond Depth (feet): **Unk**

Is the Pond Perennial or Ephemeral? **Perennial**

If Ephemeral, when does it go dry? **N/A**

Pond Vegetation: **None Visible**

Pond Substrate: **Unk**

STREAM

Label: **N/A**

Stream Bank Full Width (feet): **N/A**

Stream Bank Full Depth (feet): **N/A**

Stream Gradient: **N/A**

Are there pools? **N/A**

Yes? Size: **N/A** Yes? Depth: **N/A**

Is the Stream Perennial or Ephemeral? **N/A**

If Ephemeral, when does it go dry? **N/A**

Stream Vegetation: **N/A**

Stream Substrate: **N/A**

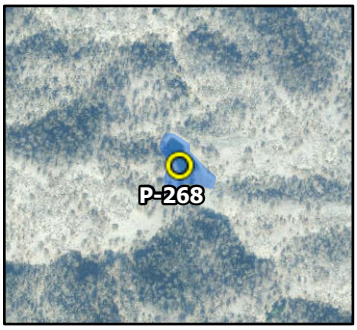
Characterize non-stream Habitat: **N/A**

Stream Bank Description: **N/A**

Other aquatic habitat characteristics, species observations, drawings, or comments:

Observed from a distance via binoculars. Potentially rocky substrate.

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **10-10-2022**

Biologist(s): **David Tange**

Pond Label: **P-268**

Stream Label: **N/A**

PHOTOS



N/A

N/A

N/A

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **10-10-2022**

Biologist(s): **David Tange**

Is the site within the current or historic range of CTS or CRLF? **Yes**

Are there known records of CTS or CRLF within 1 mile (1.6km) of the site?

POND

Label: **P-272**

Pond Size (acre): **0.503**

Pond Depth (feet): **Unk**

Is the Pond Perennial or Ephemeral? **Perennial**

If Ephemeral, when does it go dry? **N/A**

Pond Vegetation: **No emergent veg. Queries agrifolia overhanging the pond at one section. Oaks and grasses in the vicinity.**

Pond Substrate: **Rock/gravel/mud**

STREAM

Label: **N/A**

Stream Bank Full Width (feet): **N/A**

Stream Bank Full Depth (feet): **N/A**

Stream Gradient: **N/A**

Are there pools? **N/A**

Yes? Size: **N/A** Yes? Depth: **N/A**

Is the Stream Perennial or Ephemeral? **N/A**

If Ephemeral, when does it go dry? **N/A**

Stream Vegetation: **N/A**

Stream Substrate: **N/A**

Characterize non-stream Habitat: **N/A**

Stream Bank Description: **N/A**

Other aquatic habitat characteristics, species observations, drawings, or comments:

Numerous Bullfrogs observed within. White fronted geese on the banks. Man made pond with a spillway. Ground squirrel burrrows in the upland, potential (although low) for CRLF.

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **10-10-2022**

Biologist(s): **David Tange**

Pond Label: **P-272**

Stream Label: **N/A**

PHOTOS

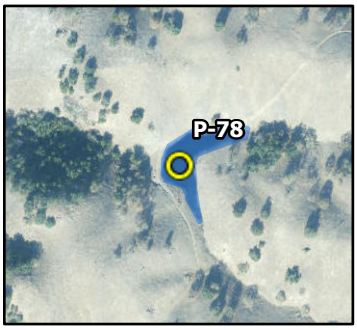








Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **10-11-2022**

Biologist(s): **David Tange**

Is the site within the current or historic range of CTS or CRLF? **Yes**

Are there known records of CTS or CRLF within 1 mile (1.6km) of the site?

POND

Label: **P-76**

Pond Size (acre): **0.204**

Pond Depth (feet): **Unk**

Is the Pond Perennial or Ephemeral? **Perennial**

If Ephemeral, when does it go dry? **N/A**

Pond Vegetation: **No emergent or overhanging vegetation visible. Pond surrounded by grasses and oaks.**

Pond Substrate: **Unk**

STREAM

Label: **N/A**

Stream Bank Full Width (feet): **N/A**

Stream Bank Full Depth (feet): **N/A**

Stream Gradient: **N/A**

Are there pools? **N/A**

Yes? Size: **N/A** Yes? Depth: **N/A**

Is the Stream Perennial or Ephemeral? **N/A**

If Ephemeral, when does it go dry? **N/A**

Stream Vegetation: **N/A**

Stream Substrate: **N/A**

Characterize non-stream Habitat: **N/A**

Stream Bank Description: **N/A**

Other aquatic habitat characteristics, species observations, drawings, or comments:

Observed from distance ridge. Great egret observed at the pond

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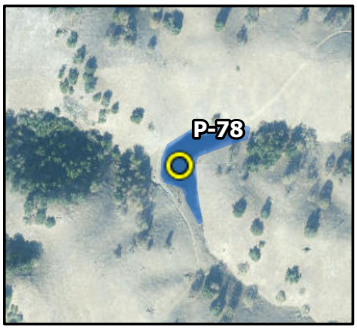
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **10-11-2022**

Biologist(s): **David Tange**

Pond Label: **P-76**

Stream Label: **N/A**

PHOTOS

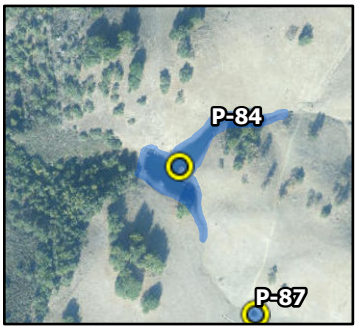


N/A

N/A

N/A

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **10-11-2022**

Biologist(s): **David Tange**

Is the site within the current or historic range of CTS or CRLF? **Yes**

Are there known records of CTS or CRLF within 1 mile (1.6km) of the site?

POND

Label: **P-84**

Pond Size (acre): **2.187**

Pond Depth (feet): **Unk**

Is the Pond Perennial or Ephemeral? **No Data**

If Ephemeral, when does it go dry? **N/A**

Pond Vegetation: **Emergent veg: cattails. Persicaria sp? On the dry pond bed although potentially also during the wet season. Overhanging trees include buckeye**

Pond Substrate: **Mud**

STREAM

Label: **N/A**

Stream Bank Full Width (feet): **N/A**

Stream Bank Full Depth (feet): **N/A**

Stream Gradient: **N/A**

Are there pools? **N/A**

Yes? Size: **N/A** Yes? Depth: **N/A**

Is the Stream Perennial or Ephemeral? **N/A**

If Ephemeral, when does it go dry? **N/A**

Stream Vegetation: **N/A**

Stream Substrate: **N/A**

Characterize non-stream Habitat: **N/A**

Stream Bank Description: **N/A**

Other aquatic habitat characteristics, species observations, drawings, or comments:

Bullfrogs and fish observed within. Likely highly suitable aquatic habitat if not for the two above species. Water is clear lots of sign of very active pigs. Ground squirrel burrows in the uplands surrounding. Artificial pond.

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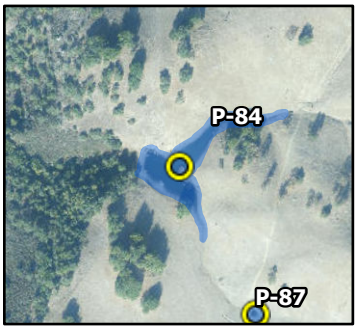
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **10-11-2022**

Biologist(s): **David Tange**

Pond Label: **P-84**

Stream Label: **N/A**

PHOTOS

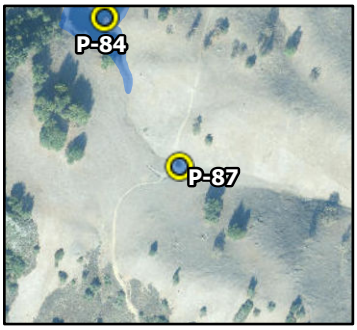








Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **10-11-2022**

Biologist(s): **David Tange**

Is the site within the current or historic range of CTS or CRLF? **Yes**

Are there known records of CTS or CRLF within 1 mile (1.6km) of the site?

POND

Label: **P-87**

Pond Size (acre): **0.133**

Pond Depth (feet): **Unk**

Is the Pond Perennial or Ephemeral? **Ephemeral**

If Ephemeral, when does it go dry? **N/A**

Pond Vegetation: **No emergent, or overhanging veg. Surrounded dominate species are just grasses.**

Pond Substrate: **Mud**

STREAM

Label: **N/A**

Stream Bank Full Width (feet): **N/A**

Stream Bank Full Depth (feet): **N/A**

Stream Gradient: **N/A**

Are there pools? **N/A**

Yes? Size: **N/A** Yes? Depth: **N/A**

Is the Stream Perennial or Ephemeral? **N/A**

If Ephemeral, when does it go dry? **N/A**

Stream Vegetation: **N/A**

Stream Substrate: **N/A**

Characterize non-stream Habitat: **N/A**

Stream Bank Description: **N/A**

Other aquatic habitat characteristics, species observations, drawings, or comments:

Small artificial pond, murky water, potential CRLF aquatic habitat. Ground squirrel burrows in the vicinity.

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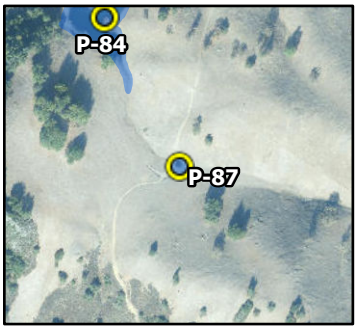
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **10-11-2022**

Biologist(s): **David Tange**

Pond Label: **P-87**

Stream Label: **N/A**

PHOTOS

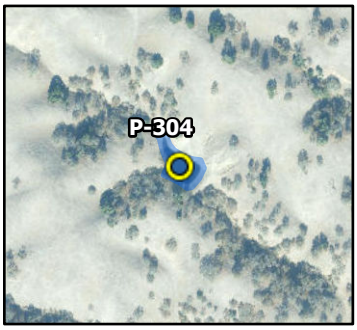


N/A

N/A

N/A

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **10-11-2022**

Biologist(s): **David Tange**

Is the site within the current or historic range of CTS or CRLF?

Are there known records of CTS or CRLF within 1 mile (1.6km) of the site?

POND

Label: **P-304**

Pond Size (acre): **0.712**

Pond Depth (feet): **Unkown**

Is the Pond Perennial or Ephemeral? **Perennial**

If Ephemeral, when does it go dry? **N/A**

Pond Vegetation: **No emergent veg, no overbearing vegetation. Green algae and potential other aquatic vegetation. Dominate surrounding species are grasses and**

Pond Substrate: **Mud**

STREAM

Label: **N/A**

Stream Bank Full Width (feet): **N/A**

Stream Bank Full Depth (feet): **N/A**

Stream Gradient: **N/A**

Are there pools? **N/A**

Yes? Size: **N/A** Yes? Depth: **N/A**

Is the Stream Perennial or Ephemeral? **N/A**

If Ephemeral, when does it go dry? **N/A**

Stream Vegetation: **N/A**

Stream Substrate: **N/A**

Characterize non-stream Habitat: **N/A**

Stream Bank Description: **N/A**

Other aquatic habitat characteristics, species observations, drawings, or comments:

Artificial pond viewed from distance hillside. Likely suitable aquatic habitat. Ground squirrel burrows in the adjacent upland.

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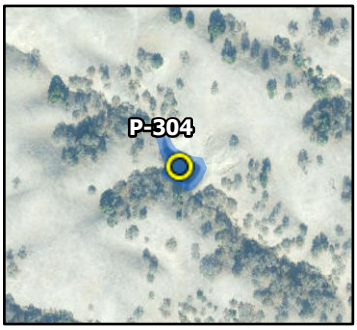
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **10-11-2022**

Biologist(s): **David Tange**

Pond Label: **P-304**

Stream Label: **N/A**

PHOTOS



N/A

N/A

N/A

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **10-11-2022**

Biologist(s): **David Tange**

Is the site within the current or historic range of CTS or CRLF?

Are there known records of CTS or CRLF within 1 mile (1.6km) of the site?

POND

Label: **P-74**

Pond Size (acre): **1.101**

Pond Depth (feet): **Unknown**

Is the Pond Perennial or Ephemeral? **Perennial**

If Ephemeral, when does it go dry? **N/A**

Pond Vegetation: **No emergent veg, no overhanging veg. Pond surrounded by oaks and grasses.**

Pond Substrate: **Mud**

STREAM

Label: **N/A**

Stream Bank Full Width (feet): **N/A**

Stream Bank Full Depth (feet): **N/A**

Stream Gradient: **N/A**

Are there pools? **N/A**

Yes? Size: **N/A** Yes? Depth: **N/A**

Is the Stream Perennial or Ephemeral? **N/A**

If Ephemeral, when does it go dry? **N/A**

Stream Vegetation: **N/A**

Stream Substrate: **N/A**

Characterize non-stream Habitat: **N/A**

Stream Bank Description: **N/A**

Other aquatic habitat characteristics, species observations, drawings, or comments:

Viewed from hillside. Artificial pond. Likely suitable aquatic habitat for CRLF. Ground squirrel burrows in adjacent upland.

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **10-11-2022**

Biologist(s): **David Tange**

Pond Label: **P-74**

Stream Label: **N/A**

PHOTOS

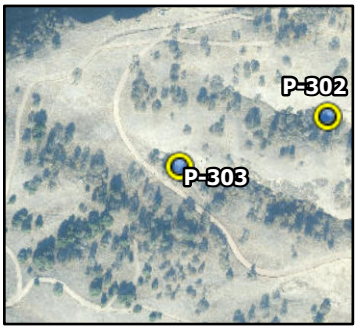




N/A

N/A

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **10-12-2022**

Biologist(s): **David Tange**

Is the site within the current or historic range of CTS or CRLF? **Yes**

Are there known records of CTS or CRLF within 1 mile (1.6km) of the site?

POND

Label: **P-303**

Pond Size (acre): **0.06**

Pond Depth (feet): **3**

Is the Pond Perennial or Ephemeral? **Ephemeral**

If Ephemeral, when does it go dry? **10-12-2022**

Pond Vegetation: **No emergent or aquatic veg. No overhanging veg, surrounding species include grasses and oaks.**

Pond Substrate: **Mud**

STREAM

Label: **N/A**

Stream Bank Full Width (feet): **N/A**

Stream Bank Full Depth (feet): **N/A**

Stream Gradient: **N/A**

Are there pools? **N/A**

Yes? Size: **N/A** Yes? Depth: **N/A**

Is the Stream Perennial or Ephemeral? **N/A**

If Ephemeral, when does it go dry? **N/A**

Stream Vegetation: **N/A**

Stream Substrate: **N/A**

Characterize non-stream Habitat: **N/A**

Stream Bank Description: **N/A**

Other aquatic habitat characteristics, species observations, drawings, or comments:

Pond was fully dry and highly cracked upon visit. Lots of gopher burrows, but few ground squirrel burrows in visible vicinity. Due to ephemeral nature, pond may Dry too quickly to be suitable breeding habitat. Additional surveys may be needed to determine if pond provides breeding habitat.

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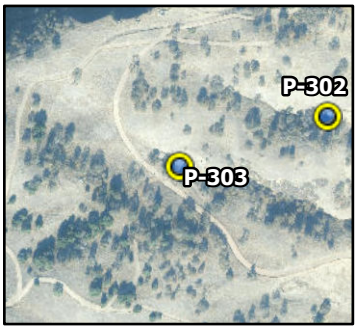
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **10-12-2022**

Biologist(s): **David Tange**

Pond Label: **P-303**

Stream Label: **N/A**

PHOTOS

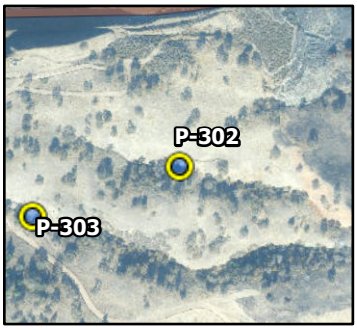




N/A

N/A

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **10-12-2022**

Biologist(s): **David Tange**

Is the site within the current or historic range of CTS or CRLF? **Yes**

Are there known records of CTS or CRLF within 1 mile (1.6km) of the site?

POND

Label: **P-323**

Pond Size (acre): **0.515**

Pond Depth (feet): **2.5**

Is the Pond Perennial or Ephemeral? **Ephemeral**

If Ephemeral, when does it go dry? **10-12-2022**

Pond Vegetation: **No emergent or overhanging veg. Surrounded by gasses and oaks, with some coyote brush on the damn wall.**

Pond Substrate: **Mud**

STREAM

Label: **N/A**

Stream Bank Full Width (feet): **N/A**

Stream Bank Full Depth (feet): **N/A**

Stream Gradient: **N/A**

Are there pools? **N/A**

Yes? Size: **N/A** Yes? Depth: **N/A**

Is the Stream Perennial or Ephemeral? **N/A**

If Ephemeral, when does it go dry? **N/A**

Stream Vegetation: **N/A**

Stream Substrate: **N/A**

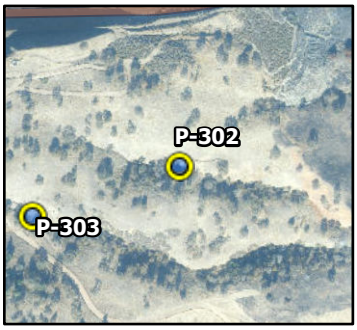
Characterize non-stream Habitat: **N/A**

Stream Bank Description: **N/A**

Other aquatic habitat characteristics, species observations, drawings, or comments:

Small artificial pond. Completely dry and cracked upon survey. There is potential that the pond dries up too early and is not suitable breeding habitat. Additional surveys should be conducted to confirm. Ground squirrel burrows were observed in the upland vicinity.

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **10-12-2022**

Biologist(s): **David Tange**

Pond Label: **P-323**

Stream Label: **N/A**

PHOTOS

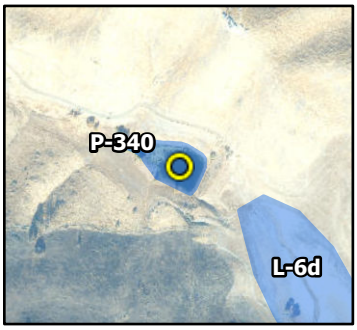




N/A

N/A

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **10-12-2022**

Biologist(s): **David Tange**

Is the site within the current or historic range of CTS or CRLF?

Are there known records of CTS or CRLF within 1 mile (1.6km) of the site?

POND

Label: **P-340**

Pond Size (acre): **1.315**

Pond Depth (feet): **Unknown**

Is the Pond Perennial or Ephemeral? **Ephemeral**

If Ephemeral, when does it go dry? **10-12-2022**

Pond Vegetation: **No emergent, no aquatic, no overhanging veg. Surrounding species include predominately grasses.**

Pond Substrate: **Mud/clay**

STREAM

Label: **N/A**

Stream Bank Full Width (feet): **N/A**

Stream Bank Full Depth (feet): **N/A**

Stream Gradient: **N/A**

Are there pools? **N/A**

Yes? Size: **N/A** Yes? Depth: **N/A**

Is the Stream Perennial or Ephemeral? **N/A**

If Ephemeral, when does it go dry? **N/A**

Stream Vegetation: **N/A**

Stream Substrate: **N/A**

Characterize non-stream Habitat: **N/A**

Stream Bank Description: **N/A**

Other aquatic habitat characteristics, species observations, drawings, or comments:

Pond already full dry and cracked upon visit. Viewed from a hillside. Artificial pond. Ground squirrel burrows likely, but not observed. May provide potential breeding habitat if the pond does not dry too quickly. Additional AI surveys are needed to determine the the pond provides breeding habitat.

Pacheco Reservoir Expansion Project
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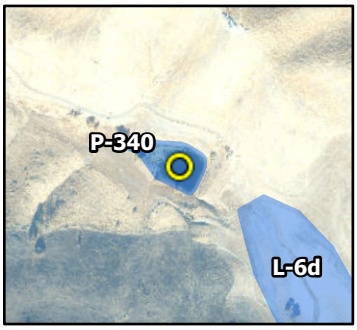


Date of Site Assessment: **10-12-2022**

Biologist(s): **David Tange**

Pond Label: **P-340**

Stream Label: **N/A**

PHOTOS

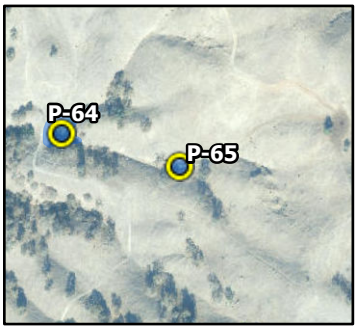




N/A

N/A

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **10-13-2022**

Biologist(s): **David Tange**

Is the site within the current or historic range of CTS or CRLF? **Yes**

Are there known records of CTS or CRLF within 1 mile (1.6km) of the site?

POND

Label: **P-65**

Pond Size (acre): **0.09**

Pond Depth (feet): **Unk**

Is the Pond Perennial or Ephemeral? **Perennial**

If Ephemeral, when does it go dry? **N/A**

Pond Vegetation: **No emergent nor overhanging veg. Aquatic algae. Surround species include grasses and oaks.**

Pond Substrate: **Mud/clay**

STREAM

Label: **N/A**

Stream Bank Full Width (feet): **N/A**

Stream Bank Full Depth (feet): **N/A**

Stream Gradient: **N/A**

Are there pools? **N/A**

Yes? Size: **N/A** Yes? Depth: **N/A**

Is the Stream Perennial or Ephemeral? **N/A**

If Ephemeral, when does it go dry? **N/A**

Stream Vegetation: **N/A**

Stream Substrate: **N/A**

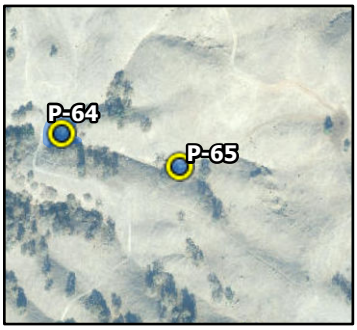
Characterize non-stream Habitat: **N/A**

Stream Bank Description: **N/A**

Other aquatic habitat characteristics, species observations, drawings, or comments:

Artificial pond. Viewed from hillside. Abundant burrows in the upland vicinity. Potential CRLF breeding habitat.

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **10-13-2022**

Biologist(s): **David Tange**

Pond Label: **P-65**

Stream Label: **N/A**

PHOTOS

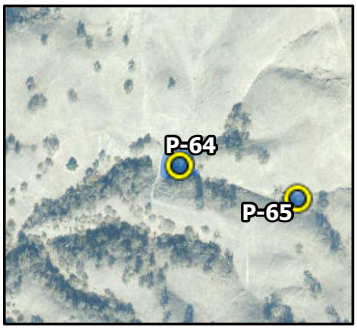




N/A

N/A

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **10-13-2022**

Biologist(s): **David Tange**

Is the site within the current or historic range of CTS or CRLF?

Are there known records of CTS or CRLF within 1 mile (1.6km) of the site?

POND

Label: **P-64**

Pond Size (acre): **0.395**

Pond Depth (feet): **Unknown**

Is the Pond Perennial or Ephemeral? **Perennial**

If Ephemeral, when does it go dry? **N/A**

Pond Vegetation: **No emergent or overhanging veg. Surrounding species included grasses and oaks.**

Pond Substrate: **Mud/clay**

STREAM

Label: **N/A**

Stream Bank Full Width (feet): **N/A**

Stream Bank Full Depth (feet): **N/A**

Stream Gradient: **N/A**

Are there pools? **N/A**

Yes? Size: **N/A** Yes? Depth: **N/A**

Is the Stream Perennial or Ephemeral? **N/A**

If Ephemeral, when does it go dry? **N/A**

Stream Vegetation: **N/A**

Stream Substrate: **N/A**

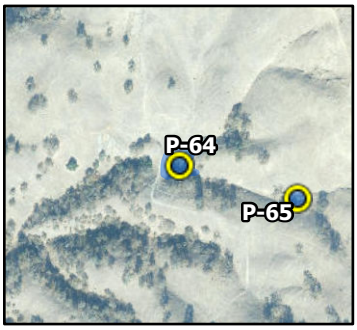
Characterize non-stream Habitat: **N/A**

Stream Bank Description: **N/A**

Other aquatic habitat characteristics, species observations, drawings, or comments:

Artificial pond. Looks deep. Viewed from hillside. Likely suitable breeding habitat. Ground squirrel burrows in the upland vicinity.

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **10-13-2022**

Biologist(s): **David Tange**

Pond Label: **P-64**

Stream Label: **N/A**

PHOTOS

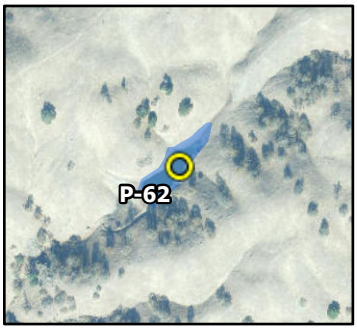


N/A



N/A

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **10-13-2022**

Biologist(s): **David Tange**

Is the site within the current or historic range of CTS or CRLF?

Are there known records of CTS or CRLF within 1 mile (1.6km) of the site?

POND

Label: **P-62**

Pond Size (acre): **0.967**

Pond Depth (feet): **Unknown**

Is the Pond Perennial or Ephemeral? **Perennial**

If Ephemeral, when does it go dry? **N/A**

Pond Vegetation: **No emergent veg, no overhanging veg. Surrounded species includes grasses and oaks.**

Pond Substrate: **Mud/clay**

STREAM

Label: **N/A**

Stream Bank Full Width (feet): **N/A**

Stream Bank Full Depth (feet): **N/A**

Stream Gradient: **N/A**

Are there pools? **N/A**

Yes? Size: **N/A** Yes? Depth: **N/A**

Is the Stream Perennial or Ephemeral? **N/A**

If Ephemeral, when does it go dry? **N/A**

Stream Vegetation: **N/A**

Stream Substrate: **N/A**

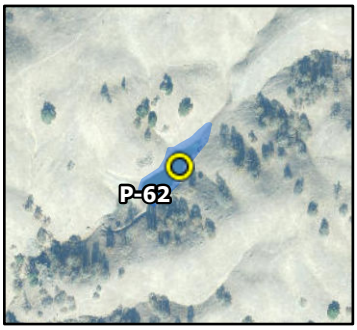
Characterize non-stream Habitat: **N/A**

Stream Bank Description: **N/A**

Other aquatic habitat characteristics, species observations, drawings, or comments:

Artificial pond. Viewed from hillside. Ground squirrel burrows in the upland vicinity. Potential breeding habitat for CRLF.

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **10-13-2022**

Biologist(s): **David Tange**

Pond Label: **P-62**

Stream Label: **N/A**

PHOTOS

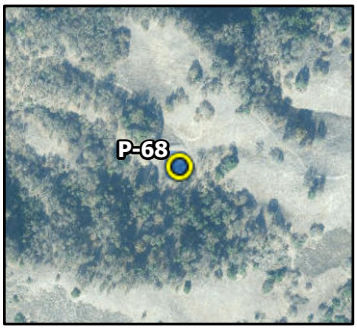




N/A

N/A

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **10-14-2022**

Biologist(s): **David Tange**

Is the site within the current or historic range of CTS or CRLF? **Yes**

Are there known records of CTS or CRLF within 1 mile (1.6km) of the site?

POND

Label: **P-68**

Pond Size (acre): **0.271**

Pond Depth (feet): **Unk**

Is the Pond Perennial or Ephemeral? **Perennial**

If Ephemeral, when does it go dry? **N/A**

Pond Vegetation: **No emergent or overhanging veg. No visible aquatic veg. Surrounding species include oaks and sparse grasses.**

Pond Substrate: **Mud/clay**

STREAM

Label: **N/A**

Stream Bank Full Width (feet): **N/A**

Stream Bank Full Depth (feet): **N/A**

Stream Gradient: **N/A**

Are there pools? **N/A**

Yes? Size: **N/A** Yes? Depth: **N/A**

Is the Stream Perennial or Ephemeral? **N/A**

If Ephemeral, when does it go dry? **N/A**

Stream Vegetation: **N/A**

Stream Substrate: **N/A**

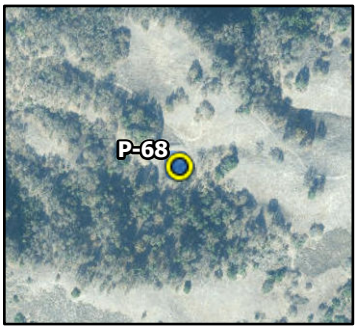
Characterize non-stream Habitat: **N/A**

Stream Bank Description: **N/A**

Other aquatic habitat characteristics, species observations, drawings, or comments:

Artificial pond. Likely suitable breeding CRLF habitat. Ground squirrel burrows in the upland vicinity.

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **10-14-2022**

Biologist(s): **David Tange**

Pond Label: **P-68**

Stream Label: **N/A**

PHOTOS

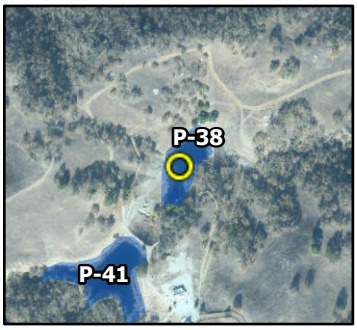




N/A

N/A

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **10-25-2022**

Biologist(s): **Brendan Cohen**

Is the site within the current or historic range of CTS or CRLF?

Are there known records of CTS or CRLF within 1 mile (1.6km) of the site?

POND

Label: **Un-labeled**

Pond Vegetation: **No Data**

Pond Size (acre): **Not Yet Calcualted**

Pond Depth (feet): **Unknown**

Is the Pond Perennial or Ephemeral? **No Data**

Pond Substrate: **No Data**

If Ephemeral, when does it go dry? **N/A**

STREAM

Label: **N/A**

Stream Vegetation: **N/A**

Stream Bank Full Width (feet): **N/A**

Stream Bank Full Depth (feet): **N/A**

Stream Gradient: **N/A**

Stream Substrate: **N/A**

Are there pools? **N/A**

Yes? Size: **N/A**

Yes? Depth: **N/A**

Characterize non-stream Habitat: **N/A**

Is the Stream Perennial or Ephemeral? **N/A**

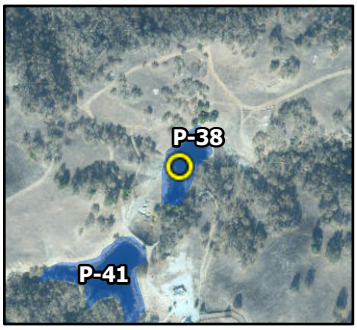
If Ephemeral, when does it go dry? **N/A**

Stream Bank Description: **N/A**

Other aquatic habitat characteristics, species observations, drawings, or comments:

N/A

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **10-25-2022**

Biologist(s): **Brendan Cohen**

Pond Label: **N/A**

Stream Label: **N/A**

PHOTOS

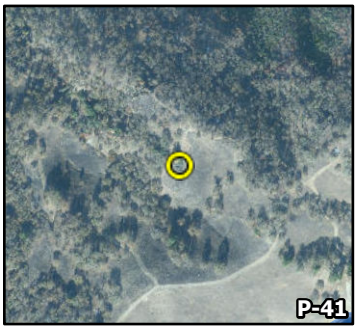




N/A

N/A

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **10-25-2022**

Biologist(s): **Brendan Cohen**

Is the site within the current or historic range of CTS or CRLF?

Are there known records of CTS or CRLF within 1 mile (1.6km) of the site?

POND

Label: **Un-labeled**

Pond Size (acre): **Not Yet Calcualted**

Pond Depth (feet): **Unknown**

Is the Pond Perennial or Ephemeral? **No Data**

If Ephemeral, when does it go dry? **N/A**

Pond Vegetation: **No Data**

Pond Substrate: **No Data**

STREAM

Label: **N/A**

Stream Bank Full Width (feet): **N/A**

Stream Bank Full Depth (feet): **N/A**

Stream Gradient: **N/A**

Are there pools? **N/A**

Yes? Size: **N/A** Yes? Depth: **N/A**

Is the Stream Perennial or Ephemeral? **N/A**

If Ephemeral, when does it go dry? **N/A**

Stream Vegetation: **Overhanging bay tree branches. Some submerged aquatic vegetation - no bank side vegetation Water present in October**

Stream Substrate: **N/A**

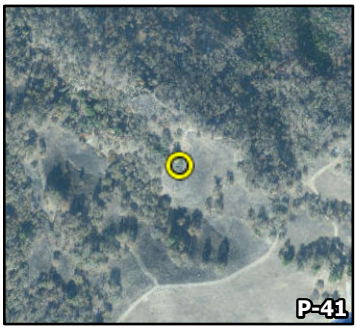
Characterize non-stream Habitat: **N/A**

Stream Bank Description: **Overhanging bay tree branches. Some submerged aquatic vegetation - no bank side vegetation Water present in October**

Other aquatic habitat characteristics, species observations, drawings, or comments:

N/A

Pacheco Reservoir Expansion Project
CTS & CRLF Habitat Assessment - 2022



Date of Site Assessment: **10-25-2022**

Biologist(s): **Brendan Cohen**

Pond Label: **N/A**

Stream Label: **N/A**

PHOTOS





N/A

N/A

Sub-exhibit 1C2 – Site Assessment Results and Survey Locations

Label	Latitude	Longitude	Area (acre)	Suitability	Aquatic Feature Type	Within Study Area
L-2	37.03261225	-121.3202216	12.25	Marginal	lake	-
O-1	37.04229438	-121.2895114	0.02	No	floodplain pool	-
P-005	37.03227933	-121.3098662	0.77	Yes	pond	-
P-007	37.02403255	-121.326257	0.03	Marginal	pond	-
P-008	37.02568083	-121.3228987	0.19	Yes	pond	-
P-009	37.03801803	-121.292141	0.04	Marginal	pond	-
P-017	37.08569172	-121.287412	0.01	No	pond	-
P-018	37.06416337	-121.3040395	0.38	Yes	pond	-
P-019	37.06675252	-121.3072818	0.02	Yes	pond	-
P-020	37.04106677	-121.282485	0.09	Yes	pond	-
P-066	37.09058818	-121.3022297	0.31	Yes	pond	-
P-067	37.08839824	-121.3069584	1.22	Yes	pond	-
P-068	37.08802713	-121.2784503	0.29	Yes	pond	-
P-069	37.08482581	-121.3025322	0.06	Yes	pond	-
P-072	37.08348756	-121.3138179	0.10	Yes	pond	-
P-075	37.07968269	-121.3195561	0.08	Yes	pond	-
P-076	37.07779472	-121.3174147	0.20	Yes	pond	-
P-077	37.0764566	-121.3118086	0.07	Yes	pond	-
P-078	37.07610661	-121.2698478	1.42	Yes	pond	-
P-079	37.07479292	-121.3163333	0.12	Yes	pond	-
P-081	37.07247415	-121.3191757	0.07	Yes	pond	-
P-082	37.06952989	-121.3206329	0.03	Yes	pond	-
P-083	37.06621086	-121.265445	1.27	Yes	pond	-
P-084	37.06437649	-121.2817987	1.90	Yes	pond	-
P-086	37.06231082	-121.2945332	181.26	No	reservoir	Yes
P-087	37.06229953	-121.2806887	0.22	Yes	pond	-
P-088	37.06147926	-121.3114822	0.08	Yes	pond	-
P-089	37.05950922	-121.3183167	1.62	Marginal	pond	-
P-091	37.05671376	-121.2723974	0.77	Yes	pond	-
P-092	37.05503213	-121.2853454	0.27	No	wetland	Yes
P-094	37.05464462	-121.2696098	0.05	Yes	pond	-
P-095	37.05407053	-121.2859608	0.10	No	wetland	Yes
P-096	37.05253975	-121.3018554	0.09	Yes	pond	-

Label	Latitude	Longitude	Area (acre)	Suitability	Aquatic Feature Type	Within Study Area
P-097	37.05249048	-121.3113377	0.25	Yes	pond	-
P-098	37.05211353	-121.3133882	0.27	Yes	pond	-
P-099	37.05189375	-121.2859102	1.40	No	wetland	Yes
P-100	37.05547311	-121.2863756	0.12	Yes	pond	-
P-101	37.04936166	-121.2903571	1.03	No	pond	-
P-102	37.04913939	-121.2855609	0.46	Yes	pond	-
P-103	37.06510878	-121.2911268	0.28	No	pond	-
P-104	37.04968874	-121.3015127	0.05	Yes	pond	-
P-105	37.04741017	-121.2903439	0.04	No	pond	-
P-106	37.04615628	-121.2972266	0.05	Yes	pond	-
P-107	37.04609383	-121.3016234	0.15	Yes	pond	-
P-108	37.04190507	-121.3149286	0.09	Yes	pond	-
P-111	37.04097744	-121.2993437	0.42	Yes	pond	-
P-117	37.03617025	-121.2799369	0.05	Yes	pond	-
P-118	37.03614827	-121.2895922	0.29	Yes	pond	-
P-120	37.03329528	-121.3103873	0.07	Marginal	pond	-
P-122	37.03205416	-121.3325494	0.09	Yes	pond	-
P-125	37.02816621	-121.328897	0.11	Yes	pond	-
P-126	37.0254964	-121.3132347	0.99	Yes	pond	-
P-133	37.02035872	-121.3133439	0.23	Yes	pond	-
P-229	37.03353624	-121.3156713	0.18	Yes	pond	-

Exhibit 1D – California Tiger Salamander Site Assessment



Exhibit 1D - California Tiger Salamander Site Assessment

Pacheco Reservoir Expansion Project Design Level Geotechnical Investigations

June 2024

Prepared by:

AECOM

Stantec GEI Consultants

Prepared for:

Valley Water

Valley Water Project Number: 91954002

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Sub-Exhibits

Sub-exhibit 1D1 – Representative Aquatic and Terrestrial Habitat Photographs
Sub-exhibit 1D2 – List of all Aquatic Features, Location, Habitat Type, Size and Suitability

Acronyms and Abbreviations

AF	acre-feet
CDFW	California Department of Fish and Wildlife
CESA	California Endangered Species Act
CNDDB	California Natural Diversity Database
CTS	California tiger salamander
DPS	Distinct Population Segment
ESA	Endangered Species Act
Project	Pacheco Reservoir Expansion Project
SCVHP	Santa Clara Valley Habitat Plan
Stantec	Stantec Consulting Inc.
USFWS	United States Fish and Wildlife Service

Executive Summary

This exhibit to the Biological Resources Assessment Report documents the findings of the California tiger salamander (*Ambystoma californiense*) (CTS) site assessment within and adjacent to the Pacheco Reservoir Expansion Project's (PREP) Design Level Geotechnical Investigations (Project) study area. The total area evaluated in this site assessment includes 55 acres within the Project study area and an additional 11,924 acres associated with a 1.24-mile buffer surrounding the Project study area (i.e., assessment area). Potential CTS habitat within the area evaluated in this site assessment consists of aquatic breeding, upland refugia, and dispersal habitats. There were 65 aquatic features evaluated in this CTS site assessment, with 4 of those aquatic features within the Project study area. Of the 65 identified aquatic features, 50 provide the essential components necessary for CTS breeding habitat (i.e., have sufficient hydroperiod and depth for egg laying and larval development) within the assessment area, and no suitable features are located within the Project study area. There are four aquatic features that provide suboptimal or marginal (i.e., low quality) CTS breeding habitat including four within the assessment area and none within the Project study area. These aquatic features are considered suboptimal or marginal CTS breeding habitat due to limiting habitat characteristics (e.g., observations of predators/competitors, nonnative and invasive species, and/or lack of vegetation for egg mass attachment). Eleven locations (seven within the assessment area and four within the Project study area) do not provide suitable breeding habitat as the features lack suitable hydroperiod to support breeding and larval development. Table ES-1 below provides a summary of the identified aquatic features within the Project study area and assessment area.

Table ES-1. Summary of Aquatic Features Identified

Analysis Area	Identified Aquatic Features			Total
	Breeding Habitat	Low Quality Breeding Habitat	Non-Breeding Habitat	
Project Study Area	0	0	4	4
Assessment Area[1]	50	4	7	61
TOTAL	**50**	**4**	**11**	**65**

Notes: (1) Assessment area consists of a 1.24-mile buffer around the Project study area. The number of aquatic features represented in this table within the assessment area exclude those found within the study area.

Approximately 41 acres of potential upland/dispersal (summer) habitat for the species is present in the Project study area and an additional 11,626 acres within the assessment area. These upland habitats generally consist of grasslands, woodlands, and scrub communities within the assessment area.

Based on the results of the CTS habitat assessment, this species has a high potential to occur within the Project study area. The Project study area is within the current range for CTS with numerous occurrences documented within the assessment area.

Chapter 1. Introduction

This exhibit to the Biological Resources Assessment Report was prepared in support of the Design Level Geotechnical Investigations (Project) that are proposed in support of Valley Water's Pacheco Reservoir Expansion Project (PREP). The Project is series of focused geotechnical investigation activities intended to inform the PREP design and planning processes. This exhibit describes the methods and results of the California tiger salamander (*Ambystoma californiense*) (CTS) site assessment conducted for the Project. The results presented in this exhibit are intended to further develop an understanding of CTS (i.e., specifically the Central Coast District Population Segment [DPS]) potential to occur within and adjacent to the Project study area, identification of potential CTS habitat, and provide both qualitative and quantitative information regarding the potential CTS habitat identified. The information generated from this exhibit is expected to be used to inform Project impact assessments/calculations for the Project.

Chapter 2. Methods

2.1 Project Study Area and Assessment Area

The Project study area for the purposes of this exhibit, is the same as the comprehensive Project footprint. The Project study area encompasses approximately 55 acres and includes all currently proposed activity areas associated with the Project (e.g., access routes, borings, test pits). The assessment area for this exhibit includes all areas within 1.24 miles of the Project study area and is approximately 11,924 acres in size. The Project study area and assessment area combined total 11,979 acres. The location and boundaries of the Project study area and the assessment area are illustrated in Figure 2-1.

2.2 Site Assessment Methods

The site assessment was conducted in accordance with the United States Fish and Wildlife Service (USFWS) Interim Guidance on Site Assessment and Field Surveys for Determining Presence or a Negative Finding of the California Tiger Salamander (USFWS 2003). The guidance provided by USFWS identifies criteria for performing CTS site assessments to ensure standardization across projects. The criteria included in the USFWS guidance consists of a review of the following: (1) documentation that the Project study area is within the current or historical range of the species; (2) identification of documented occurrences/records of the species within 3.1 miles of the Project study area; and (3) the identification of potential habitat for CTS within the Project study area and assessment area (i.e., within 1.24 miles of the Project study area).

CTS occurrences records within 3.1 miles of the Project study area were compiled from a review of the following sources:

- California Department of Fish and Wildlife (CDFW), California Natural Diversity Database (CNDDB) (CDFW 2023b)
- USFWS Draft Recovery Plan for CTS (USFWS 2017)
- iNaturalist (2023) CTS observations

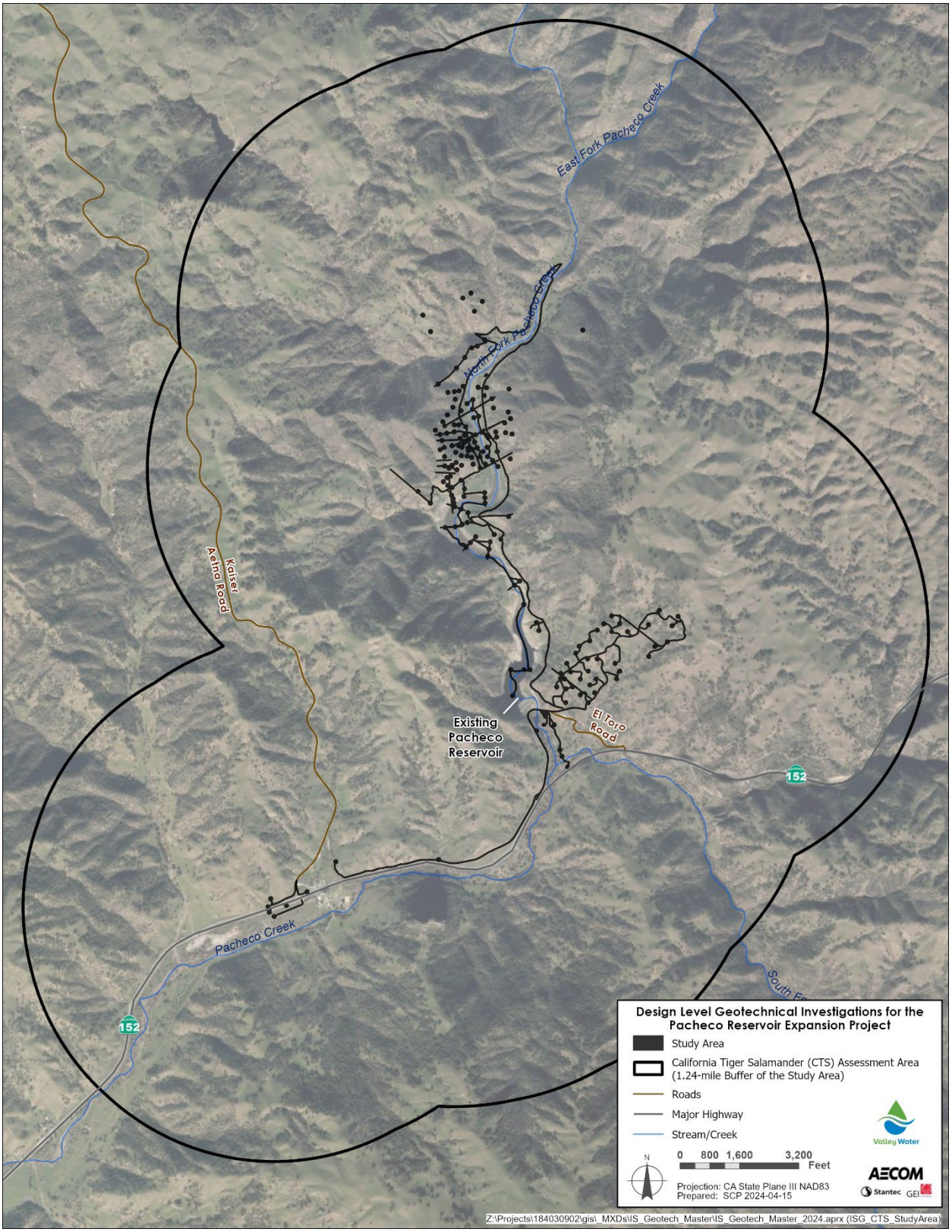

Figure 2-1. Project Study Area and Assessment Area

- Other publicly available databases and literature

Additional reports for other CTS surveys within the Project study area and 3.1-mile buffer were also consulted and reviewed to obtain additional information regarding the presence of CTS in the area. The additional reports reviewed for the purpose of this exhibit included: the Aquatic Sampling at Canada de los Osos Reserve in 2013–2019; the Cedar Creek Property – Pond Survey Results – Santa Clara County (Smith 2019; Olberding Environmental 2020); Santa Clara Valley Habitat Plan – Appendix K (County of Santa Clara 2012); personal communications (Smith 2020).

Aquatic features that could provide potentially suitable CTS habitat were identified and mapped using publicly available desktop resources, such as current and historic aerial imagery, topographic maps, and USFWS National Wetland Inventory maps. Reconnaissance-level visual assessments were conducted to review potential aquatic and upland habitats located within the Project study area that were accessible following a review of the desktop resources. Field assessments were conducted from the shoreline of each potential aquatic habitat or through the use of binoculars when not accessible and focused on identifying the essential elements of CTS breeding habitat (e.g., pond depth/size, proximity to burrows) that were accessible during the survey efforts (e.g., seasonal wetlands, livestock ponds, and other modified ephemeral and permanent ponds). The field survey efforts collected data on potential aquatic habitats including: habitat type (e.g., stock pond, seasonal wetland), apparent seasonality, approximate size (e.g., surface area), water depth at the time of the site assessment, substrate, vegetation (e.g., emergent, overhanging, dominant species), shoreline descriptions, potential water sources, and incidental observations of potential predators/competitors such as American bullfrogs (*Lithobates catesbeianus*) and centrarchids (e.g., bass, sunfish).

Potential upland habitat (i.e., areas dominated by grassland, oak savanna, or oak woodland vegetation communities around potential aquatic habitat) within the assessment area, where accessible, was also characterized and evaluated during the surveys. Information collected for the upland habitat included the identification and mapping of small mammal burrows from species such as California ground squirrel (*Otospermophilus beecheyi*) and Botta's pocket gopher (*Thomomys bottae*) that would provide upland refugia habitat for CTS. During the survey efforts, representative photographs of potential aquatic habitat and upland habitat were taken. Potential CTS habitats on private property without legal access beyond the Project study area were assessed by reviewing current and historic aerial imagery (e.g., Google Earth), topographic maps, and/or from points of public access (e.g., publicly accessible roadways). To determine the hydroperiods of the inaccessible aquatic features, aerial images from multiple years and seasons were reviewed in Google Earth.

2.3 Assessment Timeframe

Stantec Consulting Inc. (Stantec) biologists conducted reconnaissance-level habitat assessments to document potential CTS habitat within the assessment area. The site assessment surveys were conducted on March 10–12 and 30, April 1–2, and May 7–8, 2020. Additional surveys were conducted on September 21, 2022, and March 30 and 31, 2023. The timing of the field surveys was performed to coincide with the spring months when CTS larvae would be present within ponds and while the aquatic features were inundated.

2.4 Biologists Qualifications

Stantec biologists, Jared Elia, Sara Cortez, Rob Stoddard, Scott Elder, Brendan Cohen, and Nicolette Murphy performed the reconnaissance-level surveys. A summary of their qualifications and experience performing CTS surveys and site assessments are summarized below.

- Jared Elia – Over 15 years of experience conducting site assessments for CTS, and performing reconnaissance and protocol-level surveys, which has included capture and relocation of individuals. He attended the Rare Pond Species Survey Techniques workshop offered by Sonoma State University and has been approved as a qualified biologist on numerous projects by CDFW and USFWS. Jared also has over 20 hours of protocol-level survey and handling hours for CTS.

- Sara Cortez – Over 15 years of experience conducting site assessments for CTS, and performing reconnaissance and protocol-level surveys, which has included capture and relocation of individuals. She conducted surveys and site assessments for this species throughout the San Francisco Bay area and Sacramento-San Joaquin Valley.

- Rob Stoddard – Over 14 years of experience conducting site assessments for aquatic species, including CTS. He has several years of experience conducting foothill yellow-legged frog surveys and is experienced identifying the unique characteristics that distinguish CTS apart from other amphibian species.

- Scott Elder – Over 7 years of experience conducting habitat assessments and informal surveys for CTS throughout the San Francisco Bay area. He has also attended the Rare Pond Species Survey Techniques workshop offered by Sonoma State University. Scott is experienced in identifying the unique characteristics that distinguish CTS apart from other amphibian species.

- Brendan Cohen – Over 7 years of experience conducting site assessments and reconnaissance-level surveys for CTS. He has also attended the Rare Pond Species Survey Techniques workshop offered by Sonoma State University and the Amphibian of the Bay Area workshop in Santa Rosa, California. Brendan is experienced in identifying the unique characteristics that distinguish CTS apart from other amphibian species.

- Nicolette Murphy – 7 years of experience conducting site assessments and aquatic surveys for CTS. She has a 10(a)1(A) Recovery Permit for the species.

Chapter 3. Species Natural History

The CTS Central California DPS was federally listed by the USFWS under the Endangered Species Act (ESA) as threatened on August 4, 2004 (USFWS 2004). It was also listed as threatened throughout its entire range, which included the Central California, Santa Barbara, and Sonoma DPSs, under the California Endangered Species Act (CESA) on August 19, 2010 (CDFW 2023a). Critical Habitat for this species was designated by USFWS on August 23, 2005 (USFWS 2005).

The CTS Central California DPS is restricted to disjunct populations that form a ring along the foothills of the Central Valley and Inner Coast Range from San Luis Obispo, Kern, and Tulare Counties in the south, to Sacramento and Yolo Counties in the north. The recovery priority number for the CTS Central California DPS is 9C, which indicates that the DPS faces a moderate degree of threat, has a high potential for recovery, and is in conflict with development projects, such as conversion to agriculture or urban development.

The CTS is a large, stocky, terrestrial salamander with a broad, rounded snout. Total body length of adults ranges approximately from 6 to 9.5 inches (16 to 24 centimeters) (USFWS 2017). CTS has an obligate biphasic life cycle where it utilizes both aquatic and terrestrial habitats. Although larvae develop in the ponds and wetlands in which they were born, once a metamorph leaves its natal pond and enters a burrow, it will then spend the vast majority of its life underground.

Adult CTS Central California DPS engage in mass migrations during a few rainy nights per year, typically from November through April, although migrating adults have been observed as early as October and as late as May. During these rain events, adults will leave their underground burrows and return to breeding ponds to mate before returning to their underground burrows. Males typically arrive before the females and generally remain in the ponds longer than females (USFWS 2017). CTS Central California DPS have been documented to cover distances from 492 feet (150 meters) to 1.3 miles (2.2 kilometers) travelling from breeding ponds to upland terrestrial habitat (Orloff 2011). On average, it is estimated that CTS migrate 1,844 feet (562 meters) and could potentially migrate 1.5 miles (2.4 kilometers) each breeding season (Searcy and Shaffer 2011).

Females lay their eggs in the water, attaching their eggs to twigs, grass stems, or other vegetation or debris. Streams or riverine environments are typically not associated with breeding habitat and are rarely used because water velocities within these systems during the typical breeding season (November through April) do not support egg laying, as eggs would be prone to wash away. The amount of time necessary for hatching is likely related to water temperature, with eggs hatching quicker in warmer water temperatures. Reported hatching time for eggs ranges from 10 to 28 days (USFWS 2017). The larval stage of the CTS Central California DPS usually lasts 3 to 6 months, with metamorphosis beginning in late spring or early summer. Once metamorphosis occurs, juveniles typically depart their natal ponds at night and enter terrestrial habitat in search of underground burrows. Peak periods for metamorphs to leave their natal ponds have been reported from May to July. In rare instances, larvae have been reported to overwinter in ponds (USFWS 2017).

Numerous factors contribute to the decline of this species, including habitat loss, habitat fragmentation, disease, predation, and hybridization. Introduced species such as American bullfrogs, largemouth bass, largemouth bass (*Micropterus salmoides*), blue gill (*Lepomis*

macrochirus), mosquitofish (*Gambusia affinis*), and nonnative crayfish species (*Pacifastacus, Orconectes,* and *Procambarus* spp.) may prey upon one or more life stages (i.e., eggs, larvae, or adults) (USFWS 2017). In addition, the introduction of the non-native Barred tiger salamander (*Ambystoma tigrinum*) into California over 50 years ago have hybridized with the native CTS. Based on review of available documents and personal communications, some level of hybridization is most likely present in the vicinity of the Project study area.

3.1 Critical Habitat

The federal Endangered Species Act requires the federal government (i.e., USFWS) to designate critical habitat for any species it lists as endangered or threatened. It also requires the federal government to develop and implement recovery plans to promote the conservation of threatened and endangered species. The CTS Central California DPS has designated critical habitat and is the subject of the USFWS Recovery Plan for the species (USFWS 2017).

Critical habitat is identified by the presence of physical or biological features, previously termed primary constituent elements, that are essential to the conservation of a federally listed species upon which designated or proposed critical habitat for the species is based. Physical and biological features may include but are not limited to: space for growth of individuals and populations; food, water, air, light, minerals, or other nutritional or physiological requirements; cover or shelter; sites for breeding, reproduction, rearing of offspring, germination, or seed dispersal; and habitats that are protected from disturbance or are representative of the species' historic geographic and ecological distribution.

Chapter 4. Site Assessment Results

4.1 Range and Critical Habitat

Historically, the CTS Central California DPS was endemic to the San Joaquin-Sacramento River Valleys, bordering foothills, and coastal valleys of Central California (Stebbins 1985; Shaffer et al. 2013). Although the historical distribution of the CTS Central California DPS is not known in detail, their current distribution suggests that they may have been continuously distributed along the low-elevation grassland-oak woodland plant communities of the valleys and foothills (Shaffer et al. 1993; Shaffer et al. 2013). The species is known from sites on the Central Valley floor near sea level, up to a maximum elevation of roughly 3,940 feet (1,200 meters) in the coast range and 1,640 feet (500 meters) in the Sierra Nevada foothills (Shaffer et al. 2013); therefore, the study area is within the current range of the species. There is no USFWS-designated critical habitat for CTS within the assessment area.

4.2 Known Occurrences

A search of the CNDDB (CDFW 2023b) indicated that there were three occurrences of CTS within 3.1 miles of the Project study area from 1975 to 2019 (Figure 4-1). These occurrence records are located primarily along the southern limits of the assessment area and are described in Table 4-1. No incidental observations of CTS were observed during the reconnaissance-level surveys. Other assessments of ponds within 3.1 miles of the assessment area have observed CTS larvae in two ponds located west of Pacheco Reservoir and north of State Route 152; the Aquatic Sampling at Canada de los Osos Reserve in 2013–2019, and the Cedar Creek Property – Pond Survey Results – Santa Clara County (Smith 2019; Olberding Environmental 2020). These surveys occurred between 2016 and 2019. In one of the ponds, 68 CTS larvae were captured during the May 20, 2016 survey; however, no CTS were captured during the 2017 or 2018 surveys conducted in the same pond. In a separate pond, three CTS larvae were captured in 2016 and 2017. These occurrence results are not yet documented in CNDDB.

Table 4-1. California Tiger Salamander Occurrences within 3.1 Miles of the Project Study Area

CNDDB Occurrence Number	Feature Type	Distance from Project Study Area (miles)	Year Observed
#490	Pond/reservoir near historic ranch	2.1	1975
#1,151	Spring-fed stock pond	2.6	2019
#1,126	Stock pond	3.0	2014
N/A (Smith 2019)	Observed 68 CTS larvae in a pond located west of Pacheco Reservoir and north of State Route 152.	N/A	2016
N/A (Smith 2019)	Observed 3 CTS larvae in a pond located west of Pacheco Reservoir and north of State Route 152.	N/A	2016/2017

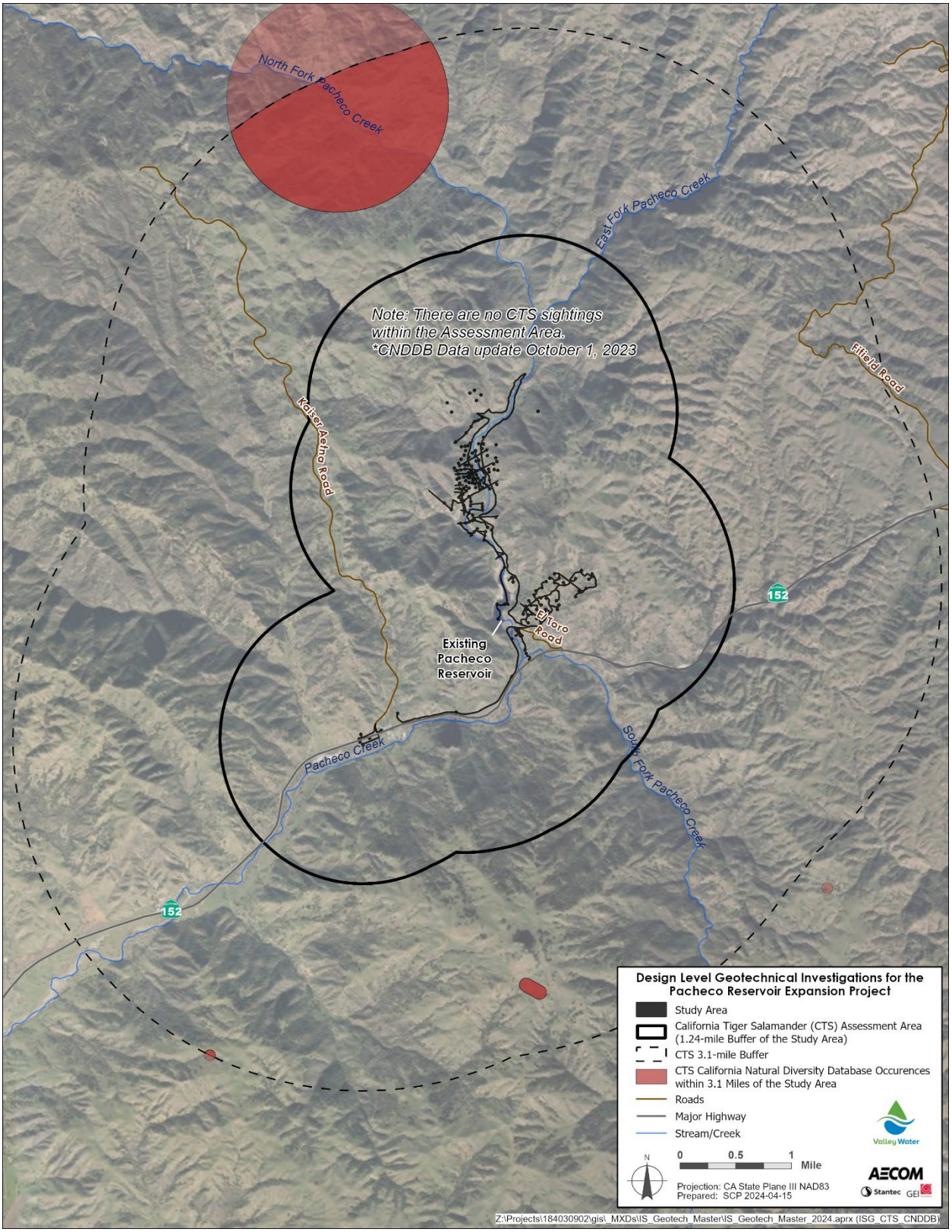

Figure 4-1. California Tiger Salamander California Natural Diversity Database Occurrences within 3.1 Miles of the Project Study Area

4.3 Potential California Tiger Salamander Habitats

Potential habitats for CTS identified in the assessment area includes aquatic breeding, upland refugia, and dispersal habitats (Figure 4-2). Representative photographs of aquatic and terrestrial habitat observed during the field surveys are provided in Sub-exhibit 1D1. A complete list of all features, their location, habitat type, size and suitability are provided in Sub-exhibit 1D2.

State Route 152 appears to function as a migration barrier for CTS within the assessment area. This barrier can reduce and/or prevent CTS from breeding in aquatic habitats and/or using potential summer habitat that require crossing the highway, because individuals can be killed trying to cross the roadway or can become desiccated with no cover trying to cross during the hot summer months. While there are drainage features that may provide travel corridors under the highway, no documentation exists that CTS use these corridors.

Aquatic Habitat

The aquatic features that were evaluated during the CTS habitat assessment consisted of four aquatic features located within the Project study area; 61 aquatic features are located beyond the Project study area within the assessment area. Of the 65 total aquatic features, 50 provide essential components of CTS breeding habitat, four provide sub-optimal or low-quality/marginal habitat, and 11 features do not provide breeding habitat. A summary of the identified aquatic features within the Project study area and assessment area is provided in Table 4-2 below.

Table 4-2. Summary of Aquatic Features Identified

Analysis Area	Identified Aquatic Features			Total
	Breeding Habitat	Low Quality Breeding Habitat	Non-Breeding Habitat	
Project Study Area	0	0	4	4
Assessment Area[1]	50	4	7	61
TOTAL	**50**	**4**	**11**	**65**

Notes: (1) Assessment area consists of a 1.24-mile buffer around the Project study area. The number of aquatic features represented in this table within the assessment area exclude those found within the Project study area.

Breeding

None of the four aquatic features identified in the Project study area provide the essential components of CTS breeding habitat (see Table 4-2, Figure 4-2, and Sub-exhibit 1D2). Outside of the Project study area, but within the assessment area, 50 of the 65 identified aquatic features provide essential components necessary for CTS breeding (Table 4-2) based on either field observations or a review of available aerial imagery (e.g., Google Earth) across multiple years and seasons. These features are small to large size ponds, ranging in size from 0.02 acre to approximately 1.9 acres. Based on observations, they have sufficient water depths and also appear to hold water long enough for CTS larvae to reach metamorphosis (i.e., generally until June and July). These features also supported emergent vegetation observed at these ponds consisting of hardstem bulrush (*Schoenoplectus acutus*), salt grass (*Distichlis spicata*), curly dock (*Rumex crispus*), broadleaf cattail (*Typha latifolia*), spike rush (*Eleocharis macrostachya*), and spiny cocklebur (*Xanthium spinosum*). Species observed at these ponds included Pacific treefrog (*Hyla regilla)*, northwestern pond turtle (*Actinemys marmorata*), American bullfrog and numerous aquatic invertebrates such as water boatmen (*Corixidae* sp.), water strider (*Gerridae* sp.), and predaceous diving beetles (*Dytiscidae* sp.).

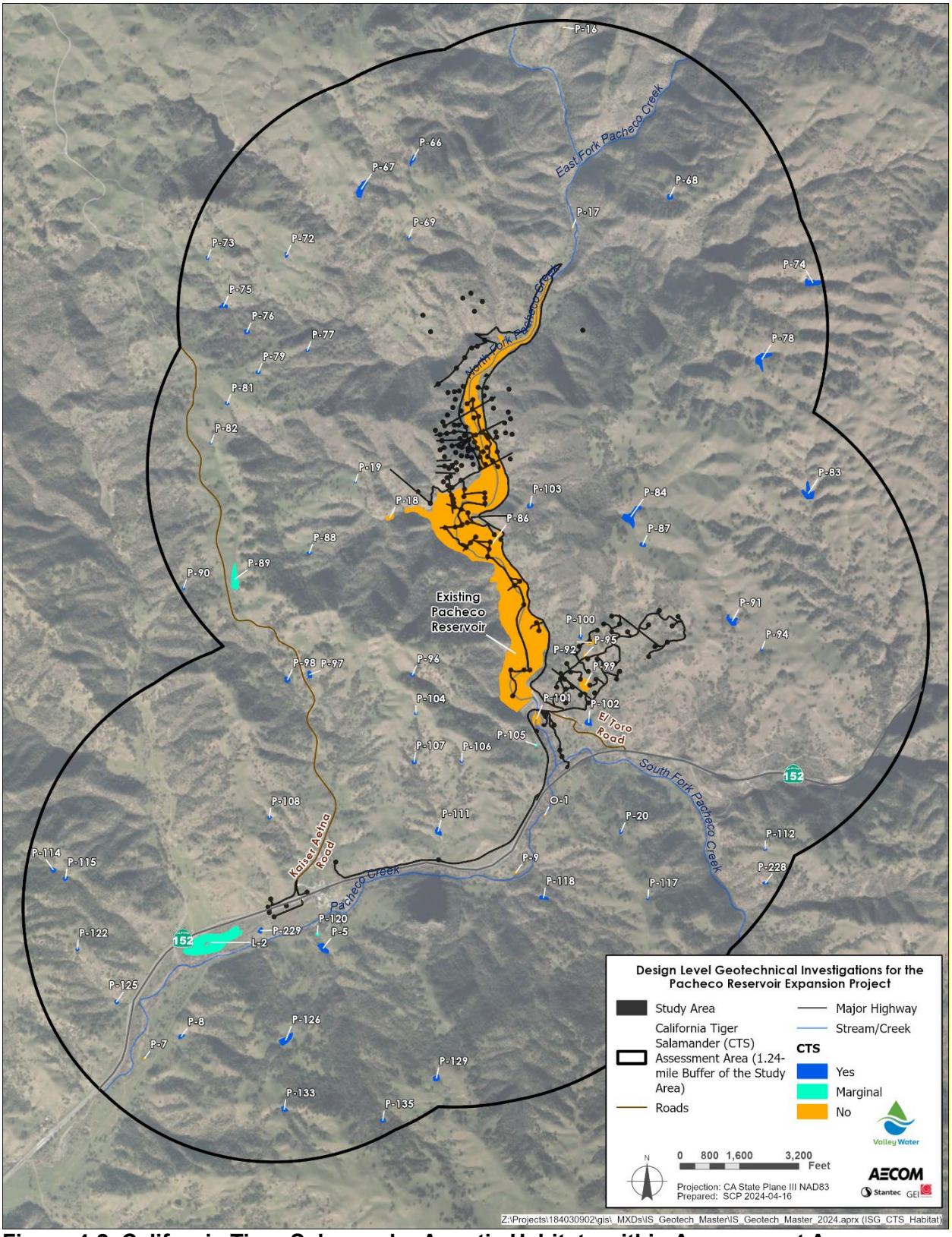

Figure 4-2. California Tiger Salamander Aquatic Habitats within Assessment Area

There are no aquatic features within the Project study area that provide low-quality CTS breeding habitat (Table 4-2). Outside of the Project study area, but within the assessment area, four of the 61 features provide marginal habitat (see Table 4-2, Figure 4-2, and Sub-exhibit 1D2). These features range from approximately 0.04 acre to approximately 12.25 acres in size and appear to only provide sufficient hydroperiod to support CTS breeding during years with above average precipitation. The marginal features that were observed during field surveys found that they either contained no vegetation or sparse vegetation, along with invasive predators/competitors (e.g., American bullfrog, sunfish) which negatively affected habitat quality.

Nonbreeding

The remaining 11 aquatic features include seven features within the assessment area and four within the Project study area (Table 4-2) that do not provide suitable breeding habitat for CTS. These features lack sufficient hydroperiod to support breeding and larval development. A complete list of all aquatic features, their location (i.e., inside the Project study area or within larger assessment area), habitat type, size, and suitability ranking are provided in Sub-exhibit 1D2.

4.4 Upland and Dispersal Terrestrial Habitat

Potentially suitable upland and dispersal habitat for CTS was observed throughout the Project study area and adjacent assessment area during field efforts. These upland areas included the presence of underground refugia (e.g., small mammal burrows) and total approximately 41 acres. Table 4-3 provides approximate acreages of the terrestrial vegetation community types within the Project study area that may provide potential upland and dispersal habitats for CTS. These upland areas were identified and characterized based on the *Terrestrial Vegetation Community Mapping Technical Memorandum* prepared for the PREP planning process, which provides characterizations for all terrestrial vegetation communities mapped within the Project study area.

Table 4-3. California Tiger Salamander Upland/Dispersal Land Cover Types within Project Study Area

Land Cover Type	Acres Within Project Study Area
Blue oak woodland	9.1
California annual grassland	14.8
Coast live oak forest and woodland	7.7
Mixed evergreen forest	0.0
Mixed riparian forest and woodland	0.1
Non-serpentine native grassland	1.5
Northern coastal scrub/Diablan sage scrub	4.9
Northern mixed chaparral/chamise chaparral	0.7
Valley oak woodland	2.4
Willow riparian forest and scrub	0.1
Total Acreage	**41.3**

Potentially suitable upland and dispersal habitat for CTS within the assessment area, but outside of the Project study area, was assessed using the Santa Clara Valley Habitat Plan (SCVHP) land cover data (Santa Clara Valley Habitat Agency 2017). Based on the data available, these upland areas consist of 11 different land cover types and total approximately 11,626 acres. Table 4-4 provides approximate acreages of the SCVHP land cover types that may provide potential upland and dispersal habitats for CTS.

Table 4-4. California Tiger Salamander Upland/Dispersal Land Cover Types within Assessment Area

Land Cover Type	Acres
Blue Oak Woodland	497.5
California Annual Grassland	2623.7
Central California Sycamore Alluvial Woodland	137.9
Foothill Pine - Oak Woodland	82.8
Mixed Oak Woodland and Forest	6965.8
Mixed Riparian Forest and Woodland	87.2
Mixed Serpentine Chaparral	180.5
Northern Coastal Scrub / Diablan Sage Scrub	3.6
Northern Mixed Chaparral / Chamise Chaparral	507.3
Valley Oak Woodland	487.9
Willow Riparian Forest and Scrub	51.8
Total Acreage	**11,625.9**

Chapter 5. References

CDFW (California Department of Fish and Wildlife). 2023a. State and Federally Listed Endangered and Threatened Animals of California. CDFW. Biogeographic Data Branch California Natural Diversity Database (CNDDB). Available at: <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=109405&inline>. Accessed on October 9, 2023.

_____. 2023b. California Natural Diversity Database. RareFind 5. California Department of Fish and Wildlife. Records search within the Mustang Peak, Pacheco Peak, Three Sisters, San Felipe, Mississippi Creek, Pacheco Pass and Gilroy Hot Springs USGS 7.5-minute quadrangles. Sacramento, CA: California Department of Fish and Wildlife. Accessed at <https://wildlife.ca.gov/Data/CNDDB/Maps-and-Data>. Last accessed on September 25, 2023.

County of Santa Clara. 2012. Santa Clara Valley Habitat Plan – Appendix K. Santa Clara Valley Habitat Agency. Accessed at <https://scv-habitatagency.org/178/Santa-Clara-Valley-Habitat-Plan>. Last accessed on October 13, 2020.

iNaturalist. 2023. California Tiger Salamander Observations. Available At: < https://www.inaturalist.org/observations?place_id=1250&taxon_id=26778 >. Accessed on March 2023.

Olberding Environmental. 2020. Cedar Creek Property – Pond Survey Results – Santa Clara County. January 31, 2020.

Orloff, S.G. 2011. Movement patterns and migration distances in an upland population of California tiger salamander (*Ambystoma californiense*). Herpetological Conservation and Biology 6(2): pp. 266-276.

Santa Clara Valley Habitat Agency. 2017. Official Santa Clara Valley Habitat Plan Land Covers. Created March 24, 2017. Updated May 9, 2017. Available: https://services2.arcgis.com/tcv2cMrq63AgvbHF/arcgis/rest/services/SCVHabitatAgencyOfficialGISDataService2/FeatureServer/2.

Searcy, C.A. and H.B. Shaffer. 2011. Determining the migration distance of a vagile vernal pool specialist: How much land is required for conservation of California tiger salamanders? Pages 73-87 In: D.G. Alexander and R.A. Schlising (Editors), Research and recovery in vernal pool landscapes. Studies from the Herbarium, Number 16. California State University, Chico, California.

Shaffer, H.B., R.N. Fisher, and S.E. Stanley. 1993. Status report: the California tiger salamander (*Ambystoma californiense*). Final report for the California Department of Fish and Game. 36 pp. plus figures and tables.

Shaffer, H.B., J. Johnson, and I. Wang. 2013. Conservation genetics of California tiger salamanders. Prepared for Dan Strait, CVP Conservation Program Manager, Bureau of Reclamation, Sacramento, California. Final report. Bureau of Reclamation grant agreement no. R10AP20598.

Smith, Jerry. 2019. Aquatic Sampling at Canada de los Osos Reserve in 2013-2019. December 31, 2019.

Smith, Jerry. 2020. Personal email communications with Jerry Smith on January 29, 2020.

Stebbins, R.C. 1985. A field guide to western reptiles and amphibians. Pages 33-36 and plates.

USFWS (U.S. Fish and Wildlife Service). 2003. Interim Guidance on Site Assessment and Field Surveys for Determining Presence or a Negative Finding of the California Tiger Salamander. October 2003. U.S. Fish and Wildlife Service, Sacramento Office.

_____. 2004. Endangered and threatened wildlife and plants; determination of threatened status for the California tiger salamander; and special rule exemption for existing routine Ranching Activities; Final Rule. Federal Register 69: 47212.

_____. 2005. Endangered and threatened wildlife and plants; designation of critical habitat for the California tiger salamander, central population: Final rule. Federal Register 70: 49380.

_____. 2017. Recovery Plan for the Central California Distinct Population Segment of the California Tiger Salamander (*Ambystoma californiense*). U.S. Fish and Wildlife Service, Pacific Southwest Region, Sacramento, California. v + 69pp.

_____. 2020. USFWS Designated Critical Habitat for California tiger salamander. USFWS Environmental Conservation Online System. Available at <https://ecos.fws.gov/ecp/>. Accessed on March 2020.

Sub-exhibit 1D1 – Representative Aquatic and Terrestrial Habitat Photographs

The following photos are documentation of conditions within the study area during the CTS habitat assessments conducted from March to April 2020.

<table>
<tr>
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<tr>
<td>Photo 1. Stock pond (P-10) upstream of Pacheco Reservoir with suitable aquatic and terrestrial habitat for CTS. Emergent vegetation is growing along the entire shoreline of the pond.</td>
<td>Photo 2. Stock pond (P-19) upstream of an ephemeral drainage that flows to Pacheco Reservoir. P-19 has suitable aquatic and terrestrial habitat for CTS.</td>
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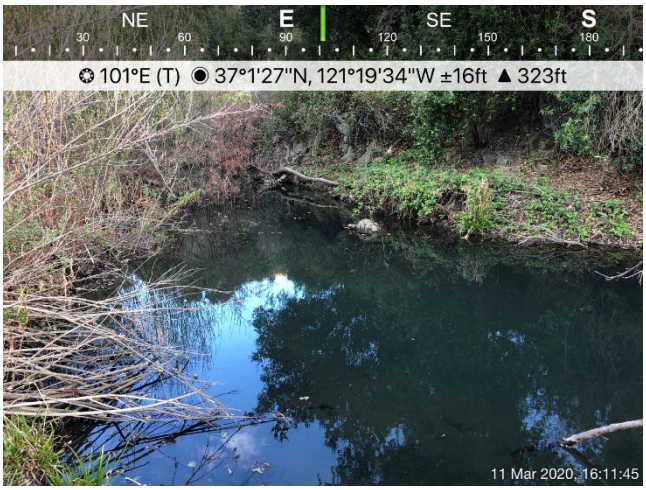
<td> 
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<tr>
<td>Photo 3. Pond (P-7) within the floodplain of Pacheco Creek, downstream of the North Fork Dam. P-7 does not provide suitable aquatic or terrestrial habitat for CTS.</td>
<td>Photo 4. Pond (P-9) within the floodplain of Pacheco Creek, downstream of the North Fork Dam. P-9 lacks emergent vegetation and does not provide suitable aquatic or terrestrial habitat for CTS.</td>
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Photo 5. Stock pond (P-15) upstream of Pacheco Reservoir with marginal suitable aquatic and terrestrial habitat for CTS. Minimal emergent vegetation is present along the shoreline.

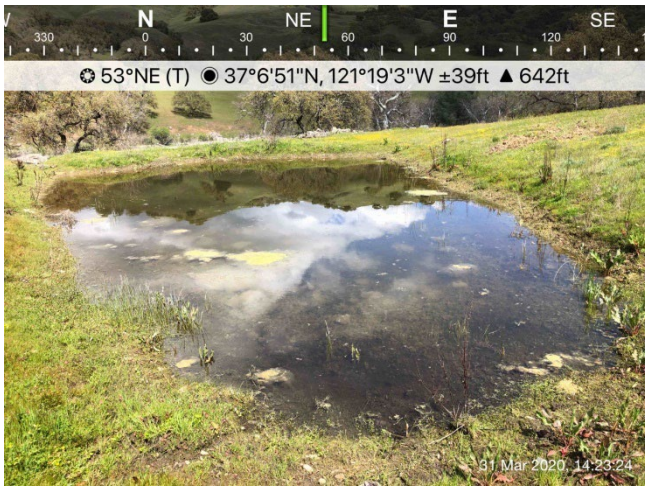

Photo 6. Stock pond (P-12) upstream of Pacheco Reservoir with marginal suitable aquatic and terrestrial habitat for CTS.



Photo 7. Ground squirrel burrows within terrestrial habitat upstream of Pacheco Reservoir.



Photo 8. Burrow colony located in grasslands upstream of Pacheco Reservoir.

Sub-exhibit 1D2 – List of all Aquatic Features, Location, Habitat Type, Size and Suitability

Label	Latitude	Longitude	Area (acre)	Suitability	Aquatic Feature Type	Within Study Area
L-2	37.03261225	-121.3202216	12.25	Marginal	lake	-
O-1	37.04229438	-121.2895114	0.02	No	floodplain pool	-
P-005	37.03227933	-121.3098662	0.77	Yes	pond	-
P-007	37.02403255	-121.326257	0.03	No	pond	-
P-008	37.02568083	-121.3228987	0.19	Yes	pond	-
P-009	37.03801803	-121.292141	0.04	No	pond	-
P-016	37.10047457	-121.2884206	0.01	No	pond	-
P-017	37.08569172	-121.287412	0.01	No	pond	-
P-018	37.06416337	-121.3040395	0.38	No	pond	-
P-019	37.06675252	-121.3072818	0.02	Yes	pond	-
P-020	37.04106677	-121.282485	0.09	Yes	pond	-
P-066	37.09058818	-121.3022297	0.31	Yes	pond	-
P-067	37.08839824	-121.3069584	1.22	Yes	pond	-
P-068	37.08802713	-121.2784503	0.29	Yes	pond	-
P-069	37.08482581	-121.3025322	0.06	Yes	pond	-
P-072	37.08348756	-121.3138179	0.10	Yes	pond	-
P-073	37.08321405	-121.3210957	0.06	Yes	pond	-
P-074	37.08175994	-121.2651798	1.07	Yes	pond	-
P-075	37.07968269	-121.3195561	0.28	Yes	pond	-
P-076	37.07779472	-121.3174147	0.20	Yes	pond	-
P-077	37.0764566	-121.3118086	0.07	Yes	pond	-
P-078	37.07610661	-121.2698478	1.42	Yes	pond	-
P-079	37.07479292	-121.3163333	0.12	Yes	pond	-
P-081	37.07247415	-121.3191757	0.07	Yes	pond	-
P-082	37.06952989	-121.3206329	0.03	Yes	pond	-
P-083	37.06621086	-121.265445	1.27	Yes	pond	-
P-084	37.06437649	-121.2817987	1.90	Yes	pond	-
P-086	37.06231082	-121.2945332	181.26	No	reservoir	Yes
P-087	37.06229953	-121.2806887	0.22	Yes	pond	-
P-088	37.06147926	-121.3114822	0.08	Yes	pond	-
P-089	37.05950922	-121.3183167	1.65	Marginal	pond	-
P-090	37.05880155	-121.3230507	0.05	Yes	pond	-
P-091	37.05671376	-121.2723974	0.77	Yes	pond	-

Label	Latitude	Longitude	Area (acre)	Suitability	Aquatic Feature Type	Within Study Area
P-092	37.05503213	-121.2853454	0.27	No	wetland	Yes
P-094	37.05464462	-121.2696098	0.05	Yes	pond	-
P-095	37.05407053	-121.2859608	0.10	No	wetland	Yes
P-096	37.05253975	-121.3018554	0.09	Yes	pond	-
P-097	37.05249048	-121.3113377	0.25	Yes	pond	-
P-098	37.05211353	-121.3133882	0.27	Yes	pond	-
P-099	37.05189375	-121.2859102	1.40	No	wetland	Yes
P-100	37.05547311	-121.2863756	0.12	Yes	pond	-
P-101	37.04936166	-121.2903571	1.03	No	pond	-
P-102	37.04913939	-121.2855609	0.46	Yes	pond	-
P-103	37.06510878	-121.2911268	0.28	Yes	pond	-
P-104	37.04968874	-121.3015127	0.05	Yes	pond	-
P-105	37.04741017	-121.2903439	0.04	Marginal	pond	-
P-106	37.04615628	-121.2972266	0.05	Yes	pond	-
P-107	37.04609383	-121.3016234	0.15	Yes	pond	-
P-108	37.04190507	-121.3149286	0.09	Yes	pond	-
P-111	37.04097744	-121.2993437	0.42	Yes	pond	-
P-112	37.03988082	-121.2691764	0.05	Yes	pond	-
P-114	37.03789393	-121.3348475	0.20	Yes	pond	-
P-115	37.03726154	-121.3337005	0.16	Yes	pond	-
P-117	37.03617025	-121.2799369	0.05	Yes	pond	-
P-118	37.03614827	-121.2895922	0.29	Yes	pond	-
P-120	37.03329528	-121.3103873	0.07	Marginal	pond	-
P-122	37.03205416	-121.3325494	0.09	Yes	pond	-
P-123	37.03009491	-121.2790175	0.48	Yes	pond	-
P-125	37.02816621	-121.328897	0.11	Yes	pond	-
P-126	37.0254964	-121.3132347	0.99	Yes	pond	-
P-129	37.02273336	-121.2993275	0.36	Yes	pond	-
P-133	37.02035872	-121.3133439	0.23	Yes	pond	-
P-135	37.01959555	-121.304223	0.19	Yes	pond	-
P-228	37.03736796	-121.2691373	0.07	Yes	pond	-
P-229	37.03353624	-121.3156713	0.18	Yes	pond	-

Exhibit 1E – Other Special-Status Wildlife Species Habitat Assessment



Exhibit 1E - Other Special-Status Species

Pacheco Reservoir Expansion Project Design Level Geotechnical Investigations

June 2024

Prepared by:

AECOM
Stantec GEI Consultants

Prepared for:

Valley Water

Valley Water Project Number: 91954002

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Acronyms and Abbreviations

AF	acre-feet
CDFW	California Department of Fish and Wildlife
CESA	California Endangered Species Act
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
FGC	Fish and Game Code
FP	Fully protected
MBTA	Migratory Bird Treaty Act
Project	Pacheco Reservoir Expansion Project
SR	State Route
SSC	Species of special concern
U.S.	United States
USFWS	United States Fish and Wildlife Service
WAFWA	Western Association of Fish and Wildlife Agencies
XSIC	Xerces Society for Invertebrate Conservation

Executive Summary

This exhibit to the Biological Resources Appendix has been prepared in support of the Pacheco Reservoir Expansion Project (PREP). Valley Water's PREP is a multi-agency effort to provide water supply reliability, environmental restoration, and other benefits through the construction of new facilities and long-term operation strategies. PREP would include expanding the storage capacity of the existing Pacheco Reservoir up to approximately 140,000 acre-feet (AF) through construction of a new dam, conveyance facilities, and appurtenant infrastructure.

This exhibit provides the results of special-status species reconnaissance-level habitat assessment surveys conducted in 2019, 2020, and 2023 for the larger PREP planning and design process. Information on special-status plant species, California red-legged frog, and California tiger salamander are included as additional exhibits to the *Biological Resources Assessment Report*. Separate attachments to the Biological Resources Appendix are being prepared for the results of the terrestrial vegetation communities mapping, aquatic resources delineation, stream habitat mapping, and focused eagle surveys performed for the larger PREP planning process. As such, this exhibit addresses the "other special-status species" not addressed in the other exhibits to the Biological Resources Assessment Report. This exhibit excludes special-status plants, California red-legged frog, California tiger salamander, terrestrial vegetation mapping, aquatic resources delineation information, and the results of focused eagle surveys.

Results for special-status wildlife species that have potential to occur in the Project study area were based on a desktop review of available literature/databases including California Natural Diversity Database (CNDDB) occurrence data. Survey results/data from the aquatic resources delineation, terrestrial vegetation communities mapping, botanical surveys, and the California red-legged frog and California tiger salamander site assessments (i.e., Exhibits 1A-1D) were used to further inform the potential for the "other special-status species" to occur. Excluding the special-status plants, California red-legged frog, California tiger salamander, fish, and eagles, 33 "other special-status species" have potential to occur.

Chapter 1. Introduction

This exhibit to provides the results of special-status species reconnaissance-level habitat assessment surveys conducted in 2019, 2020, and 2023 in support of the proposed 2024 geotechnical investigations (Project) necessary to develop the design of essential infrastructure necessary for Valley Water's Pacheco Reservoir Expansion Project (PREP) planning and design process. Information on special-status plant species, California red-legged frog, and California tiger salamander are included as additional exhibits to the Attachment 1 – Biological Resources Assessment Report. Additional attachments to the Biological Resources Appendix have been prepared for the results of the terrestrial vegetation communities mapping, aquatic resources delineation, and other special-status wildlife species habitat assessments specific to the Project. As such, this report addresses the "other special-status species" not addressed in the other exhibits to the Biological Resources Assessment Report.

Chapter 2. Methods

The Project study area is centered around Pacheco Reservoir and includes areas adjacent to Pacheco Creek, North Fork Pacheco Creek and South Fork Pacheco Creek where geotechnical investigations for the Project are proposed (Figure 2-1). In total, the Project study area encompasses approximately 55 acres and includes the currently proposed impact areas associated with geotechnical borings, test pits, staging areas, and access routes. See Figure 2-1 for the Project study area.

Numerous surveys were conducted within the Project study area in 2019, 2020, 2022, and 2023 in conjunction with the PREP planning and design process to assess if suitable potential habitat for special-status birds, amphibian, reptile, and mammalian species are present. These surveys were generally conducted between August and September 2019, March through May of 2020, September 2022, and March through August of 2023. Surveys to identify suitable habitat for special-status insects were conducted in February and May 2019, March through May 2020, and July through August 2020 in conjunction with the vegetation mapping and botanical surveys.

Special-Status Species Desktop and Literature Review

Special-status species that may occur in the Project study area were determined, in part, by reviewing natural resource agency databases, literature, and other relevant sources. Regionally occurring special-status species were identified based on a review of pertinent literature, the United States (U.S.) Fish and Wildlife Service (USFWS) species list, California Natural Diversity Database (CNDDB), and California Native Plant Society (CNPS) database records. For each special-status species identified during the desktop/literature review process, habitat requirements were assessed and compared to the habitats identified in the Project study area to determine if potential suitable habitat for the species is present.

The desktop and pertinent literature review results identified 40 regionally occurring special-status wildlife species. The habitat requirement for each of these 40 species were assessed and compared to the habitats identified in the Project study area during field surveys to determine if potentially suitable habitat to support the species occurs within the Project study area. Out of the 40 special-status wildlife species, 37 species were determined to have potential to occur. Excluding California red-legged frog, California tiger salamander, fish, and eagles there are 33 “other special-status” wildlife species that have a potential to occur.

Special-Status Species

For the purpose of this exhibit, special-status species includes wildlife species that are (1) listed as threatened or endangered under the California Endangered Species Act (CESA) or the federal Endangered Species Act (ESA); (2) proposed for ESA listing as threatened or endangered; (3) CESA or ESA candidate species; (4) identified by the California Department of Fish and Wildlife (CDFW) as species of special concern (SSC) or fully protected species (FP); or (5) have been identified by resource agencies as having the potential to be proposed for listing in the immediate future. As mentioned above, information on the special-status plant species, California red-legged frog, California tiger salamander, and eagles are not included as part of this exhibit; they are discussed in separate exhibits supporting the Biological Resources Assessment Report.

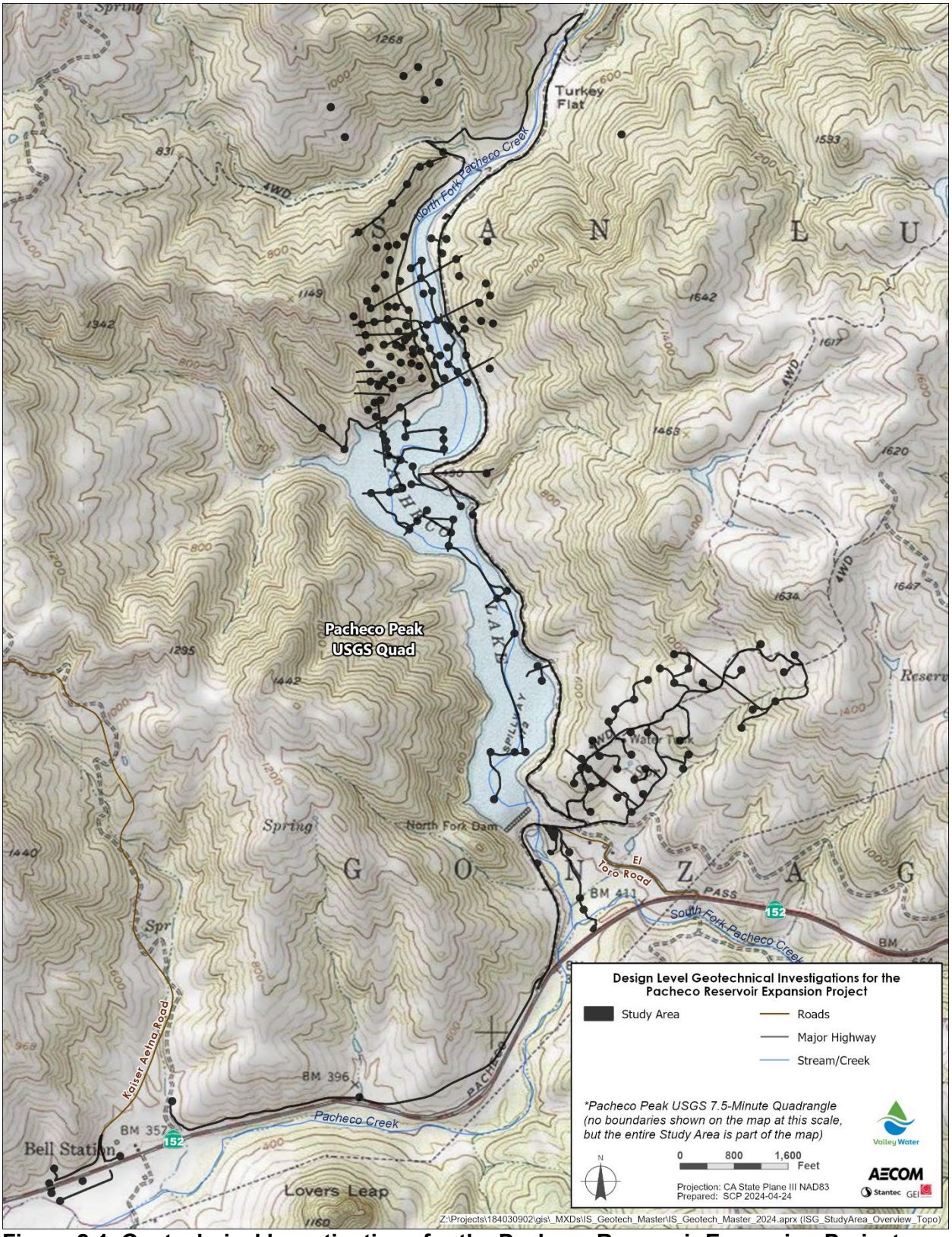

Figure 2-1. Geotechnical Investigations for the Pacheco Reservoir Expansion Project Botanical and Wildlife Habitat Assessment Project Study Area

Results

Results for special-status wildlife species that have potential to occur in the Project study area were based on a desktop review of available literature and databases, including CNDDB occurrence data. Survey results and data from the aquatic resources delineation, terrestrial vegetation communities mapping, botanical surveys, and the California red-legged frog and California tiger salamander site assessments were used to further inform the potential for the "other special-status" species to occur. Excluding the special-status plants, California red-legged frog, California tiger salamander, fish, and eagles, 29 "other special-status species" identified in Table 3-1 below, have potential to occur, and are further described in the sections below:

Table 3-1. Other Special-Status Species with Potential to Occur in the Project Study Area

Species Name (Common/*Scientific*)	Listing Status (Federal/State)
Insects	
Monarch butterfly (Danaus plexippus plexippus)	FC/NL
Crotch's bumble bee (*Bombus crotchii*)	NL/CE
Herpetofauna	
Foothill yellow-legged frog (*Rana boylii*)	T/E
Northwestern pond turtle (*Actinemys marmorata*)	PT/SSC
Silvery legless lizard (*Aniella pulchra pulchra)*	NL/SSC
San Joaquin coachwhip (Masticophis flagellum ruddocki)	NL/SSC
Coast horned lizard (*Phrynosoma blainvillii*)	NL/SSC
Birds	
Tricolored blackbird (*Agelaius tricolor*)	NL/T
Grasshopper sparrow (*Ammodramus savannarum*)	NL/SSC
Long-eared owl (*Asio otus*)	NL/SSC
Western burrowing owl (*Athene cunicularia*)	NL/SSC
Swainson's hawk (*Buteo swainsoni*)	NL/T
Vaux's swift (*Chaetura vauxi*)	NL/SSC
Northern harrier (*Circus cyaneus*)	NL/SSC
Olive-sided flycatcher (*Contopus cooperi*)	NL/SSC
White-tailed kite (*Elanus leucurus*)	NL/FP
American peregrine falcon (*Falco peregrinus anatum*)	NL/SOI
California condor (Gymnogyps californianus)	E/E, FP
Yellow-breasted chat (*Icteria virens)*	NL/SSC
Loggerhead shrike (*Lanius ludovicianus*)	NL/SSC
Purple martin (*Progne subis*)	NL/SSC
Yellow warbler (Setophaga petechia)	NL/SSC
Least Bell's vireo (*Vireo bellii pusillus*)	E/E

Species Name (Common/*Scientific*)	Listing Status (Federal/State)
Mammals	
Pallid bat (Antrozous pallidus)	NL/SSC
Ringtail (Bassariscus astutus)	NL/FP
Tule elk (Cervus canadensis nannodes)	NL/SOI
Townsend's big-eared bat (*Corynorhinus townsendii*)	NL/SSC
Western mastiff bat (Eumops perotis californicus)	NL/SSC
Western red bat (Lasiurus blossevillii)	NL/SSC
Dusky-footed woodrat (Neotoma fuscipes annectens)	NL/SSC
Mountain lion (*Pumas concolor*)	NL/CT
American badger (*Taxidea taxus*)	NL/SSC
San Joaquin kit fox (*Vulpes macrotis mutica*)	E/T

Note:
[1]Status Codes: Federal and State Codes: E = Endangered; T = Threatened; CT= Candidate Threatened; CE= Candidate Endangered; FC = Federal Candidate; FP = Fully Protected; SSC= CDFW Species of Special Concern; SOI= Species of Interest NL-Not Listed.

Special-Status Insects

Monarch Butterfly

Distribution, Biology, and Habitat Requirements

The monarch butterfly has no formal federal or state listing status but is considered a candidate by the USFWS for listing under the federal ESA. The USFWS determined that the listing is warranted, but precluded by higher priority listing actions; however, the listing status could change in the next 1-3 years. This large butterfly has a wingspan of about 3.9 inches and distinct coloring on the wings, with dark to brown veins on an orange background and two rows of white spots at the margin (Western Association of Fish and Wildlife Agencies [WAFWA] 2019). The monarch butterfly is in the family Nymphalidae. The monarch butterfly range includes almost all of North America, excluding Canada north of 50 degrees latitude (northern limit of milkweed [*Asclepias* spp.]) and parts of British Columbia, Washington, and Oregon (The Center for Biological Diversity Center et al. 2014).

Monarch butterflies overwinter at forested groves along coastal California and Baja California, arriving at overwintering locations in September and departing from overwintering locations in March (WAFWA 2019). Migrating monarchs depend on milkweed for nectar and as a host plant for laying eggs and larval development. Other plant species are used as nectar plants for adults including thistles (*Carduus* sp.) and purple loosestrife (*Lythrum salicaria*) (WAFWA 2019). Most overwintering monarchs are in reproductive diapause and their activity is limited to feeding, sunning, and rehydrating.

Migratory and breeding habitats consists of the same characteristics including milkweed for feeding and for egg laying/larval development, nectar plants, and places to roost (e.g., trees and shrubs), with connectivity between the feeding and roosting habitats. Both fall and spring migrations require the same habitat elements (WAFWA 2019). The host and nectar plants for monarchs grow in a variety of vegetation communities including forests, woodlands, chaparral, and grasslands. Overwintering habitat is primarily located along the coast, within approximately 1.5 miles from the Pacific Ocean and includes groves of trees that create microclimates for monarch survival (WAFWA 2019). Native tree species used for overwintering include Monterey pine (*Pinus radiata*), Monterey cypress (*Cupressus macrocarpa*), western sycamore (*Platanus racemosa*), and other native tree species. Monarchs will also overwinter in non-native eucalyptus (*Eucalyptus* spp.) trees but will choose native tree species when available (WAFWA 2019). Suitable grove conditions include dappled sunlight, access to water and nectar, high humidity, temperatures above freezing, and protection from strong winds and storms.

Monarch butterflies go through metamorphosis, consisting of four stages: egg, larva, pupa, and adult, in approximately one month. However, the rate of metamorphosis is dependent on temperature, with colder temperatures slowing development (WAFWA 2019). Breeding adults can live from 2 to 5 weeks and adults in reproductive diapause can live 6 to 9 months.

Occurrence Records

The CNDDB only tracks overwintering occurrences for this species. There are no CNDDB occurrences within 5-miles of the Project study area.

Suitable Habitat within the Project Study Area

Potential suitable breeding and migration habitat for the monarch butterfly occurs adjacent to and upstream of Pacheco Reservoir within the Project study area. Downstream of the reservoir, habitat becomes fragmented due to State Route (SR) 152 and developed areas, creating marginal breeding and migration habitat. The Project study area does not support overwintering habitat. Breeding and migration habitat are dependent upon the species host and nectar plants, which grow in a variety of vegetation communities. Within the Project study area, there is approximately 54 acres of breeding and migration habitat. Breeding habitat consisting of the host plant (milkweed) with large and scattered populations of the plant species having been documented throughout the Project study area upstream of North Fork Dam. Migration habitat is also present in the Project study area consisting of forests, woodlands,

chaparral, and grasslands. Based on the potential breeding and migration habitat within the Project study area and occurrences of monarch butterfly, this species has a moderate potential to occur within the Project study area.

Crotch's Bumble Bee

Distribution, Biology, and Habitat Requirements

Crotch's bumble bee is a CESA candidate endangered species. Crotch's bumble bee is easily distinguished from other species in the Apidae family based on hair coloration and size. The size of Crotch's bumble bees varies, with queens ranging from approximately 0.9 to 1 inch in length (XSIC et al. 2018). Workers range from approximately 0.5 to 0.8 inches, and males range from 0.6 to 0.7 inches in length (XSIC et al. 2018). Until recently, there has been little survey effort for the CBB in Santa Clara County. Historical CNDDB records indicate that the species has been found in Santa Clara County in Palo Alto, San Jose, and San Antonio Valley (CNDDB 2023). Except for one record in 1994, all historical records are pre-1960. As such, the Xerces Society for Invertebrate Conservation et al. (2018) and CDFW (2019) indicated that there were only historical occurrences, and no recent occurrences, anywhere in the South San Francisco Bay area when the species was petitioned for state listing. However, since CDFW was petitioned to list Crotch's bumble bee and three other bumble bee species in 2018, interest in seeking and reporting bumble bees has increased among community scientists. The first Santa Clara County record since 1994 was of an individual in Santa Teresa County Park on March 25, 2019 (iNaturalist 2023). Since then, community scientists and professional biologists have recorded the species in nearly 20 additional Santa Clara County locations (Bumble Bee Watch 2023, iNaturalist 2023). In particular, Valley Water and H. T. Harvey & Associates biologists have detected more than 80 individuals at 12 locations between July 2022 and August 2023.

Crotch's bumble bees inhabit open grasslands and scrub habitats for both foraging, and overwintering nesting habitat. Primary land cover types that provide these three habitat requirements are grassland, chaparral, and scrub; oak woodlands likely provide suitable habitat as well. Secondarily, riparian, wetlands, and the habitat along reservoirs and within drained reservoirs can provide foraging habitat as well. They are primarily believed to nest underground in animal burrows. Crotch's bumble bees visit a large variety of flowering plants to forage for nectar, including plants from the following genera: *Asclepias, Salvia, Lupinus, Vicia, Acmispon, Phacelia, Eschscholzia*, and *Centaurea* (Bumble Bee Watch 2023). Very little is known about overwintering sites, but studies show that they overwinter in soft, disturbed soils or under leaf litter (XSIC et al. 2018).

Occurrence Records

The nearest occurrence is within the Upper Cottonwood Creek Wildlife Area, approximately 5.5 miles east of the Project study area (Bumble Bee Watch 2024).

Suitable Habitat within the Project Study Area

Potential foraging and nesting habitat (i.e., grasslands and scrub habitats) for Crotch's bumble bee is present both upstream and downstream of North Fork Dam. Within the Project study area, there is approximately 54 acres of potential foraging and nesting habitat consisting of grassland and scrub vegetation, as well as other vegetation communities. Based on these results, this species has a high potential to occur within the Project study area.

Special-Status Amphibians

Foothill Yellow-legged Frog

Distribution, Biology, and Habitat Requirements

The Project study area is located within the range of the foothill yellow-legged frog Central Coast Distinct Population Segment (DPS) which became listed as threatened under the federal ESA on August 29, 2023, and the West/Central Coast clade, which is listed as endangered under CESA. The historic range for this foothill yellow-legged frog included the western Cascades in Oregon, the coast ranges south to

the San Gabriel Mountains, and western side of the Sierra Nevada Mountains south to the edge of the Tehachapi Mountains. Foothill yellow-legged frogs can vary in color from gray, brown, olive, or red. Adult frogs' range in size from approximately 1 to 3 inches long while tadpoles typically range in size from approximately 1.5 to 2 inches. Foothill yellow-legged frogs occur in streams flowing through a variety of vegetation types, including valley-foothill hardwood, valley-foothill hardwood-conifer, valley-foothill riparian, ponderosa pine, mixed conifer, mixed chaparral, and wet meadows (Sawyer and Keeler-Wolf 2009). Frogs seem to favor channels with at least some shading (i.e., greater than 20 percent) cast by riparian vegetation. However, when canopy closure is too great (i.e., over 90 percent), foothill yellow-legged frogs are rarely found, potentially given the lack of suitable breeding and basking sites, and reduced levels of appropriate food (Moyle 1973). In a landscape-scale habitat analysis of frogs in Oregon, Olsen and Davis found that stream order, minimum temperatures, precipitation frequency, stream gradient, and elevation were important variables in predicting species presence (Olsen and Davis 2009).

Foothill yellow-legged frogs typically breed between late April and early July. Breeding site selection occurs at two scales; populations congregate at suitable breeding habitat sites along streams and rivers, and females select specific oviposition sites within these breeding habitats. Breeding and rearing habitat is generally located in gently flowing, low-gradient stream sections with variable substrates predominated by cobble and boulder. Foothill yellow-legged frogs breed at locations that provide suitable velocities and depths over a relatively broad range of discharge volumes, ranging from small tributaries to large rivers (Lind 1996). In larger channels, breeding sites are often at point bars or depositional environments near the tail-end of pools, and in proximity to tributary confluences. These sites have reduced chances of scour, seem to have some degree of spatial stability on a local scale, and are consequently used annually over many years. In smaller streams, egg masses are in depositional areas with cobble and boulder substrates such as runs, or the tails and outlets of pools (H.T. Harvey and Associates 2020).

Occurrence Records

There is one documented CNDDB occurrence (#2074, observed March 4, 1950) just outside the Project study area for this species, located along Pacheco Creek near SR 152 and Kaiser-Aetna Road.

Suitable Habitat Within the Project Study Area

Based on the results from the reconnaissance-level habitat assessment surveys along with terrestrial vegetation mapping and the aquatic resources delineation, the Project study area contains 0.1 acre of potentially suitable aquatic breeding habitat in North Fork Pacheco Creek and along the South Fork Pacheco Creek and 0.04 acre of potentially suitable aquatic dispersal habitat within the ephemeral and intermittent drainages in the Project study area. Based on this information and the presence of potentially suitable habitat within the Project study area, foothill yellow-legged frog has a moderate potential to occur in the portion of the Project study area upstream of North Fork Dam.

Special-Status Reptiles

Northwestern Pond Turtle

Distribution, Biology, and Habitat Requirements

Northwestern pond turtle is a proposed federal threatened species and is a CDFW SSC. Northwestern pond turtles are small to medium size turtles usually dark brown or olive in color with an unkeeled carapace. Northwestern pond turtles range extends from Washington through western Oregon and California, south to Baja California. Northwestern pond turtles are typically active from spring to early fall depending on temperature but may be active during warmer winter periods. During winter, the turtles go into hibernation and estivation which can be done either under water or burrows in sandy soils associated with woodlands. During their active period they occupy slow water aquatic habitats like ponds, lakes, streams, marshes, and irrigation ditches. They require platforms for basking including sun exposed rocks, logs, cattail matts, or stream banks. Hatchlings require shallow water with dense submergent or short emergent vegetation.

Northwestern pond turtles mate in spring and summer between late April and early August. Nesting sites occur in sandy soils in upland areas in the vicinity of their aquatic site. Hatchlings may emerge in late summer or fall, but some turtles may overwinter in the nest and emerge the following spring (Ernst et al. 2009).

Occurrence Records

Several northwestern pond turtles were documented downstream of the North Fork and South Fork Pacheco Creek confluence just outside the Project study area during the 2019 and 2020 surveys. There are multiple CNDDB occurrences of this species within 5 miles of the Project study area.

Suitable Habitat within the Project Study Area

Approximately 6.6 acres of aquatic dispersal habitat occurs in the form of the existing reservoir (within the Ordinary High Water Mark), ephemeral and intermittent drainages, and seasonal wetlands. Numerous areas of basking habitat were also observed within and outside the Project study area, including rock outcrops, logs, gravel, and sandy banks. Approximately 23.6 acres of nesting habitat occurs throughout the Project study area in the form of grasslands and valley oak woodland. The Project study area contains approximately 23.8 acres of dispersal habitat which consists of woodlands and scrub/chaparral vegetation communities. Northwestern pond turtles are present in the Project study area given the observations during the surveys and the abundance of available habitat.

Silvery Legless Lizard, San Joaquin Coachwhip, and Coast Horned Lizard

Distribution, Biology, and Habitat Requirements

The Project study area is within the range of silvery legless lizard, San Joaquin coachwhip, and coast horned lizard. All three species are considered SSC by CDFW. Information on each of the species' biology, life history, and habitat requirements are described below.

Silvery Legless Lizard. Silvery legless lizards are a small slender lizard with no legs, a blunt snout and tail, eyelids, and smooth shiny scales. They range in length from 11 to 18 inches long. They can be metallic silver, beige, brown, or black in color. This lizard occurs from the southern edge of the San Joaquin River in northern Contra Costa County south to Ventura County and intermittently in in the San Joaquin Valley, southern Sierra Nevada mountains, Tehachapi Mountains, and San Gabriel Mountains.

Silvery legless lizards occur in areas with sandy or loose loamy soils, often areas under sparse vegetation including beaches, chaparral, or pine-oak woodland and often near riparian vegetation along stream terraces. They do not bask in direct sunlight and can tolerate cool temperatures. This lizard feeds primarily on insect larvae under leaf litter. Silvery legless lizards are rarely found moving above ground, but sometimes can be found on the surface at dusk or in the evening (Stebbins 1985). There is little information about the breeding habits of this species. Gonadal examinations of captured specimens indicate that breeding occurs in the spring and continues until July (Goldberg and Miller 1985).

San Joaquin Coachwhip. Adult San Joaquin coachwhips are 36 to 66 inches long with smooth scales, a relatively large head and eyes, a thin neck, and a long thin tail. They can be tan, olive, brown, or yellowish in color. San Joaquin coachwhip, is endemic to California, ranging from Arbuckle in the Sacramento Valley at the norther potion of their range to the southern foothills in Kern County and in portions of the Southern Coast Range. San Joaquin coachwhip is a subspecies of the coachwhip (*Coluber flagellum)* which is common occurs across the southern half of the U.S. from southern California east to Florida, and into Mexico including northeast Baja California.

San Joaquin coachwhip snakes are active during the daytime and can tolerate high temperatures. They are found in grassland, desert, scrub, chaparral, and pasture habitats. They prefer treeless areas and avoid dense vegetation. They may take refuge in rodent burrows, in areas shaded by vegetation, or under large objects. They are a constrictor species, crushing their prey prior to consuming it. This snake primarily preys upon small mammals. San Joaquin coachwhips suffer from habitat loss and fragmentation

in its range due to conversion of habitat to agricultural use and urban development. These practices reduce or eliminate the snake's food and habitat sources.

Coast Horned Lizard. The coast horned lizard is a flat-bodied lizard with a wide oval-shaped body, enlarged pointed scales on the upper body and tail, and large spines on the head. These lizards can be reddish, brown, yellow, or grey in color on their dorsal side with cream, beige, or yellow bellies. Their historic range was along the Pacific coast of California from the Baja California to Bay area and in the Sacramento/ Joaquin Valley from Redding, California to the Kern Plateau east of Bakersfield, California. Found in a wide variety of habitats, most common in lowlands along sandy washes with scattered low bushes. Uses open areas for sunning, bushes for cover, patches of loose soil for burial, and feed on ants and other insects. Occurs in the Sierra Nevada foothills and throughout the central and southern California coast. Coast horned lizards have been eliminated from much of their historic habitat due to habitat loss from land development and agriculture and reduction of food sources.

Occurrence Records

Coast horned lizards were observed within the PREP study area north of the Project study area in grassland habitats. No CNDDB occurrences for silvery legless lizard, San Joaquin coachwhip, and coast horned lizard have been documented within 5 miles of the Project study area.

Suitable Habitat within the Project Study Area

The woodland, riparian, chaparral, and grassland vegetation communities present in the Project study area provide approximately 41 acres of potentially suitable habitat for silvery legless lizard and coast horned lizard. Based on the soil types find in the Project study area, there is potential for the formation of sandy soils along waterways and other areas subject to erosion; as a result, there is a moderate potential for both species to occur.

Grasslands and scrub/chaparral habitats are present in the Project study area and provide potential habitat for the San Joaquin coachwhip. Approximately 21 acres of grassland and scrub/chaparral occurs within the Project study area. Although no CNDDB occurrences for this species have been documented within 5 miles of the Project study area, potentially suitable habitat for this species occurs within the Project study area; therefore, this species has a moderate potential to occur.

Special-Status and Other Protected Birds

Birds nest in a variety of places, including trees, shrubs, man-made structures, and the ground. This section describes the special-status and migratory birds protected under the federal ESA, the Migratory Bird Treaty Act (MBTA)[1] and under Sections 3500-3516 of the California Fish and Game Code[2] (FGC) for game birds and birds of prey that have potential to occur in the Project study area. Several bird species including raptors, waterfowl, and passerines occur within the Project study area and were observed during the field surveys occurring during the 2019 and 2020 field seasons.

Least Bell's Vireo

Distribution, Biology, and Habitat Requirements

Least Bell's vireo is listed as endangered both under CESA and the federal ESA, with USFWS designated critical habitat occurring in southern California. They are small birds, approximately 11.5 to 12.5 centimeters long and have short, rounded wings and short, straight bills with a faint white eye ring. Their

[1] The MBTA of 1918 enacts the provisions of treaties between the U.S., Great Britain, Mexico, Japan, and the Soviet Union and authorizes the U.S. Secretary of the Interior to protect and regulate the taking of migratory birds. This treaty makes it unlawful to take, possess, buy, sell, purchase, or barter any migratory bird listed under the act, including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations.
[2] Section 3500-3516 give CDFW authority to protects game birds, birds of prey, migratory birds, and fully protected birds from take or possession, except as otherwise provided by the code (e.g., incidental take under CESA).

feathers are mostly gray above and pale below. The species' historical breeding range was widespread throughout California, including the Sacramento and San Joaquin Valleys. Santa Clara County's first record was a nest with eggs collected in 1932 in a dense willow thicket along the Pajaro River near Sargent.

Least Bell's vireo is known to nest in riparian woodlands dominated by willow and Fremont's cottonwood. Suitable willow woodlands are typically dense with well-defined vegetative strata or layers. The most critical structural component of nesting habitat in California is a dense shrub layer 2 to 10 feet above the ground. Ideal nesting habitat consists of a riparian corridor at least 800 feet wide. Individuals may forage in adjacent scrub or chaparral habitat and during winter they utilize scrub vegetation adjacent to watercourses or riparian gallery forests along the west coast of northern and central Mexico.

Occurrence Records

There are no CNDDB occurrences within 5 miles of the Project study area. The nearest extant and most recent CNDDB occurrence (#198, observed 5/18/2001 and updated 1/23/2002) was documented in a dense multi-story riparian area dominated by willows approximately 12 miles west of the southwestern portion of the Project study area along Llagas Creek. The second CNDDB occurrence (#504, observed 4/29/1932 and updated 2/18/2014) is located approximately 14 miles southwest of the Project study area along U.S. Highway 101 near Carnadero Creek and Tar Creek. Further focused surveys were performed nearly annually for this species from 1997 through at least 2010, following the observation of the species in 1997 and 2001; however, the species has not been detected since 2001 (Santa Clara County 2012).

Suitable Habitat within the Project Study Area

Based on the field surveys conducted in 2019 and 2020 only low-quality riparian foraging habitat for the species exists in the downstream portions of the Project study area. Potential nesting habitat is absent in the Project study area given the riparian woodlands lack the stratified structure, vegetative density, and are less than 400 feet wide (i.e., much less than the 800-foot width required by the species). Based on the surveys conducted, less than 0.1 acre of low-quality foraging habitat exists within the Project study area. Least Bell's vireo has a low potential to occur within the Project study area and surrounding 250-foot area given the lack of suitable nesting habitat, the age of the last documented occurrence of the species in the region (i.e., 20 years old), and negative findings after more than 10 years of focused surveys following the 2001 sighting.

Other Special-Status and Nesting Migratory Passerines

The following eight other special-status passerine species have potential to occur in the Project study area:

- Grasshopper sparrow: CDFW SSC
- Tricolored blackbird: CESA threatened
- Vaux's swift: CDFW SSC
- Olive-sided flycatcher: CDFW SSC
- Yellow warbler: CDFW SSC
- Yellow-breasted chat: CDFW SSC
- Loggerhead shrike: CDFW SSC
- Purple martin: CDFW SSC

In addition to these special-status passerine species, other migratory nesting birds protected under the MBTA and Sections 3500-3516 of the FGC also have potential to nest in many of the habitats and land cover types identified in the Project study area.

Distribution, Biology, and Habitat Requirements

The eight special-status and the migratory passerines have been known to nest and forage in a variety of habitats and land cover types such as woodlands and shrublands, grasslands, open water, and anthropogenic structures such as bridges, structures, and roads. Nests can occur in multiple locations,

including but not limited to, the branches of trees or shrubs, tree cavities, on the ground, or in burrows. Many of the passerines that nest in the area arrive in early spring (e.g., late February/early March) and nesting activities continue well into late summer (e.g., July/August). General descriptions of each of the six special-status passerine species habitat preferences and breeding/nesting season timing are provided below.

Tricolored blackbird are colonial nesters and prefer to nest in dense stands of fresh emergent vegetation, large Himalayan blackberry (*Rubus armeniacus*) thickets, and rice (*Oryza* sp.) fields. Typically, tricolored blackbirds will start colony formation and breeding starting in March and end in July. Fall migration can occur as late as October in some years and locations (Santa Clara County 2012).

Both yellow warbler and yellow breasted chat nest in dense woody riparian areas. The yellow warbler nests in areas that contain tree species such as willows (*Salix* sp.) and cottonwoods (*Populus* sp.). Yellow warblers construct their nests in upright forks of branches in shrubs, small trees, and briars from 2 to 60 feet above ground (CDFW 2014). Yellow warblers typically breed from mid-April into early August. The yellow breasted chat nests in low, dense vegetation such as raspberry, blackberry, grapevine, dogwood, hawthorn, cedar, multiflora rose, honeysuckle, and sumac. Their nests are typically 1 to 8 feet above the ground, supported by branches and often by masses of vegetation. The typical nesting season for yellow breasted chat is May through July (CDFW 2014).

Loggerhead shrike and grasshopper sparrow prefer to nest in grasslands and shrub habitats. Nesting occurs in the early spring for loggerhead shrikes with nests placed in dense (and often thorny) tree or shrub—usually 5 to 30 feet above the ground (CDFW 2014). The grasshopper sparrow nests on the ground, very well hidden at the base of a weed, shrub, or clump of grass and typically occurs between May and August (CDFW 2014).

Purple martin nests in cavities, typically snags with woodpecker holes and sometimes cavities in nesting boxes and utility poles. They usually nest in colonies or as isolated pairs, which occurs in the spring (CDFW 2014).

Both olive-sided flycatcher and Vaux's swift nest in conifer forests. Vaux's swift is likely to nest in large tree cavities, although it is more commonly observed nesting in chimneys. Both species rely on forests with open canopies and adjacent foraging habitat (CDFW 2014). The Project study area is outside of their typical breeding areas, although they could forage within the Project study area while migrating.

Occurrence Records

Table 3-2 below shows the CNDDB occurrences within 5 miles of the Project study area for the special-status passerine species with a potential to occur.

Table 3-2. Special-Status Passerines CNDDB Occurrences within 5 Miles of the Project Study Area

Species	Nearest CNDDB Occurrence Records to the Project Study Area
Grasshopper sparrow	No CNDDB occurrences within 5 miles of the Project study area.
Tricolored blackbird	There is one CNDDB occurrence within 5 miles of the Project study area. The nearest CNDDB occurrence (#856, observed 4/19/21) is just outside (less than 0.1 mile west of the southwest portion of the Project study area).
Vaux's swift	No CNDDB occurrences within 5 miles of the Project study area.
Olive-sided flycatcher	No CNDDB occurrences within 5 miles of the Project study area.
Yellow warbler	No CNDDB occurrences within 5 miles of the Project study area.
Yellow breasted chat	No CNDDB occurrences within 5 miles of the Project study area.
Loggerhead shrike	No CNDDB occurrences within 5 miles of the Project study area.
Purple martin	No CNDDB occurrences within 5 miles of the Project study area.

Suitable Habitat within the Project Study Area

Suitable foraging habitat for the eight other special-status passerine species is present in the Project study area. Suitable nesting habitat for five of the eight other special-status passerine species is present in the Project study area (no nesting habitat present for tricolored blackbird, Vaux's swift, or olive-sided flycatcher). Small patches of woody riparian habitats occur amounting to less than 0.1 acre, for yellow warbler and yellow breasted chat downstream of North Fork Dam. Grassland and shrubland habitats that could support grasshopper sparrow and loggerhead shrike nesting is also present throughout the Project study area and amounts to approximately 22 acres. There is no suitable nesting habitat for tricolored blackbird (i.e., emergent marsh or willow thickets) in the Project study area or surrounding 250-foot area, although 16 acres of grassland foraging habitat is present in the Project study area. Approximately 20 acres of woodland habitats that may contain snags and cavities (e.g., oak woodlands) suitable for purple martin nesting are present within the Project study area.

The Project study area also provides a wide array of potential nesting and foraging habitat for a variety of migratory birds protected under the MBTA and species protected under Sections 3500-3516 of the FGC. These bird species may utilize habitats and land cover types such as the oak and riparian woodlands, shrubland and chaparral communities, and annual grasslands in the Project study area for nesting.

Given the presence of potential habitat within the Project study area, grasshopper sparrow, tricolored blackbird (potential foraging habitat only), yellow warbler, yellow-breasted chat, loggerhead shrike, purple martin, olive-sided flycatcher (potential foraging habitat only), and Vaux's swift (potential foraging habitat only) all have a moderate potential to occur. Many migratory passerines protected under the MBTA have been documented within or in the immediate vicinity of the Project study area during survey efforts and include species such as California scrub jay (*Aphelocoma californica*), Canada goose (*Branta canadensis*), common merganser (*Mergus merganser*), acorn woodpecker (*Melanerpes formicivorus*), and California quail (*Callipepla californica*).

Special-Status and Protected Raptor Species

The following seven special-status raptor species have potential to occur in the Project study area based on the results of the desktop/literature review and field surveys:

- Long-eared owl: CDFW SSC
- Western burrowing owl: CDFW SSC
- Swainson's hawk: CESA threatened
- Northern harrier: CDFW SSC
- White-tailed kite: CDFW FP
- California condor: CESA and ESA endangered and CDFW FP
- American peregrine falcon: SOI[3]

In addition to these special-status raptor species, other migratory nesting raptors protected under the MBTA and Sections 3500-3516 of the FGC also have potential to occur in many of the habitats and land cover types identified in the Project study area.

Distribution, Biology, and Habitat Requirements

The seven special-status and protected raptor species listed above have been known to nest and forage in a variety of habitats and land cover types such as woodlands and shrublands, and grasslands. Nests can occur in multiple locations, including but not limited to, the branches of trees or shrubs, tree cavities, on the ground, or in burrows. Many of the raptor species could nest in the Project study area typically beginning their nesting activities as early as February and can continue well into late summer (e.g.,

[3] California Senate Billl 147, July 10, 2023 removed the American peregrine falcon from the CDFW Fully Protected Species List. Due to ongoing agency interest, species designated as SOI are carried forward in this document for continuity with previous Valley Water planning efforts.

July/August). General descriptions of each of these special-status raptor species habitat preferences and breeding/nesting season timing are provided below.

Long-eared owls prefer to nest in edge habitats of dense riparian stands and other thickets near the edges of meadows and other openings that can be used for foraging. The typical long-eared owl breeding season generally starts about early March and continues into late July (CDFW 2014).

Burrowing owls are a colonial nesting species that typically use rodent or other small mammal burrows (e.g., ground squirrel [*Otospermophilus beecheyi*]) for cover and nesting in grasslands or open shrublands. Burrowing owls can be year-round residents, and their nesting season typically starts in March and continues through August (CDFW 2014). Breeding in the project area is not expected given the higher elevations. Western burrowing owl may overwinter in the project area as migrants from up north come down.

Swainson's hawk and white-tailed kites typically nest in trees or large shrubs often surrounded by open areas such as grasslands or agricultural fields that are utilized for foraging. Nesting activities for both species typically begins in February/March with a peak in nesting activities occurring about May (CDFW 2014) and concludes with chicks fledging as late as September/October in some instances. Per the CDFW Five Year Status Review for Swainson's Hawk (2016), most young have fledged by mid- to late-August with most young in the Central Valley fledging in early July. Migration back to the wintering grounds begins mid-August, and by October most hawks have left California (Kochert et al. 2011)."

American peregrine falcon and California condor prefer high cliffs for nesting habitat. American peregrine falcon prefers nesting sites over water whereas California condor will choose a cave or large crevice in a cliff. The nesting season for American peregrine falcon starts in early March and lasts until late August. California condors begin nesting as early as February with the young being capable of flight in 5-6 months after hatching. California condor chicks remain dependent upon their parents for more than 6 months after learning to fly (CDFW 2014).

Occurrence Records

Table 3-3 below shows the CNDDB occurrences within 5 miles of the Project study area for the special-status raptor species with a potential to occur.

Table 3-3. Special-Status Raptor CNDDB Occurrences within 5 Miles of the Project Study Area

Species	Nearest CNDDB Occurrence Records to the Project Study Area
Long-eared owl	There are no CNDDB occurrences within 5 miles of the Project study area.
Western burrowing owl	There are no CNDDB occurrences within 5 miles of the Project study area.
Swainson's hawk	There are no CNDDB occurrences within 5 miles of the Project study area.
Northern harrier	There are no CNDDB occurrences within 5 miles of the Project study area.
White-tailed kite	There are no CNDDB occurrences within 5 miles of the Project study area; however, this species has been observed along Kaiser-Aetna Road within 5 miles of the Project study area.
California condor	There are no CNDDB occurrences within 5 miles of the Project study area.
American peregrine falcon	There are no CNDDB occurrences within 5 miles of the Project study area: however, this species has been observed in Henry Coe State Park within the PREP study area.

Suitable Habitat within the Project Study Area

The Project study area provides potentially suitable foraging habitat for all seven special-status raptors species. The Project study area provides potentially suitable nesting habitat for four of these special-

status raptor species (no nesting habitat present for Western burrowing owl, American peregrine falcon, or California condor). Approximately 16 acres of grassland habitats may provide foraging habitat for all seven of the special-status raptor species. Approximately 25 acres of woodland and scrub habitats that may provide suitable nesting for Swainson's hawk and white-tailed kite. Approximately 19 acres of dense woodland habitats in the Project study area may provide suitable nesting habitat for the long-eared owl. No cliff habitats to support American peregrine falcon or California condor nesting were observed in the Project study area.

Based on the potential nesting and foraging habitat within the Project study area long-eared owl and Swainson's hawk have a moderate potential to occur. Based on presence of foraging and overwintering habitat Western burrowing owl has a moderate potential to occur. Northern harrier has been observed within the Project study area. White-tailed kite and American peregrine falcon have been observed outside the Project study area but within the PREP study area and have a high potential to occur. Although there is a lack of nesting habitat for California condor, there are several recent observations of this species in the vicinity of the Project study area (U.S. Geological Survey 2024); therefore, this species has a high potential to occur. Other common protected raptor species that have been documented in the Project study area during survey efforts include species such as red-tailed hawk (*Buteo jamaicensis*) and red-shoulder hawk (*Buteo lineatus*).

Special-Status Mammals

Mammal habitat assessments were conducted using terrestrial vegetation mapping along with daytime pedestrian surveys and visual observations within the Project study area to identify suitable habitat for special-status mammals. Information collected during the habitat assessment and considered in the following discussions included data on the following characteristics: vegetation communities, aquatic features, surrounding land use, barriers to movement, slopes and presence of suitable breeding and dispersal habitats. The biology, habitat requirements, occurrence data, and suitable habitat within the study area for each species with potential to occur in the Project study area is discussed below.

Mountain Lion

Distribution, Biology, and Habitat Requirements

The mountain lion Southern California/Central Coast Evolutionarily Significant Unit is a CESA candidate threatened species. Mountain lions are large, slender cats with short, muscular limbs and long tails that equal about one third of the lion's total length. Males are usually larger than females and range in length from approximately 7 to 7.5 feet, with females ranging from approximately 6.5 to 7 feet (Yap et al 2019). Historically, the mountain lion's range included all of North America, but has since been reduced to one third of its original range. In California, their habitat has been fragmented due to development and roadway construction, creating populations and subpopulations within their range. The Southern California/Central Coast Evolutionarily Significant Unit consist of the following subpopulations:

- Santa Ana Mountains
- Eastern Peninsular Range
- San Gabriel/San Bernardino Mountains
- Central Coast South
- Central Coast North
- Central Coast Central

Mountain lions occupy a variety of habitats including pine forests, oak woodlands and savannahs, riparian woodlands, chaparral, and grasslands. They require large amounts of undisturbed habitat for dispersal and foraging, and individuals are territorial and live a solitary life (except for breeding) (Yap et al 2019). Mountain lion prey consists of mainly deer (*Odocoileus hemionus*), Tule elk (*Cervus canadensis nannodes*), and wild hogs (*Sus scrofa*), with other large and small mammals making up a smaller portion of prey, including livestock, wild horses, and coyotes. Mountain lions are polygamous breeders and may

breed year-round, but timing may be dependent on prey abundance and climate. In North America, April through September is the most common time for kitten births (Yap et al 2019). Gestation can last 82 to 96 days and litter sizes range from one to six kittens, with two to four kittens per litter being the typical amount. Females care for their young for 1 to 2 years, then either abandon the cubs or become aggressive towards them to stop them from following her since males will kill cubs (Yap et al 2019).

Occurrence Records

This species is not tracked by any state database (i.e. CNDDB); therefore, there are no occurrence records for this species. However, suitable habitat for this species does occur within the Project study area and potential signs of mountain lion predation and tracks have been observed within in the vicinity of the Project study area as part of surveys for PREP. In addition, other past unrelated studies have documented the species within the PREP study area (Pathways for Wildlife 2020).

Suitable Habitat within the Study Area

All terrestrial habitat adjacent to and upstream of North Fork Dam is suitable habitat for mountain lions. Downstream of the dam, habitat becomes fragmented due to SR 152 and developed areas, creating marginal foraging habitat. Within the Project study area there are approximately 47 acres of suitable foraging habitat consisting of woodlands, grasslands, aquatic features and scrub/shrublands. The Project study area also provides suitable habitat for mountain lion prey including mule deer and wild hogs (observed during habitat assessment surveys). Due to observations of mountain lion sign within the PREP study area in the vicinity of the Project, the species is known to occur within the Project study area.

Tule Elk

Distribution, Biology, and Habitat Requirements

Tule elk does not have a listing status but is closely managed by CDFW within its range to maintain herd size and genetic integrity. It is the smallest North American elk and is endemic to California. Average adult bulls weigh between 450 – 700 pounds, and average cows weigh between 375 – 425 pounds. Coats are a light beige color with a darker brown mane circling the necks of males and females. Calves have similar coloration to deer fawns, and all individuals have white rumps. Adults average 7 feet in length and 4 – 5 feet at the shoulder (CDFW 2023).

Historically, tule elk were found throughout the Central Valley, central Coast Range, and central coast. Following over-hunting in the 19th century, with a population estimate of as few as 2 – 4 total individuals, a law was passed in 1873 to fully protect the species. , The recovery of the species has been carefully managed by multiple State agencies, and the current total estimated population of approximately 5,700 tule elk in California are currently managed in multiple herds throughout their range by CDFW (CDFW 2023).

Tule elk inhabit a range of temperate and semi-arid habitats, which reflects the diverse areas their current herds have been established. The species relies on grassland, shrubland, and woodland habitats throughout the year, and is generally found within 4 miles of a water source. Annual grasses and forbs are eaten throughout the year, and other graminoids (e.g., sedges) are also a food source (CDFW 2023). During calving season, herds will utilize shrub and tree cover, but the species does not have set migrations. Rather herds will move into different habitats and areas based on climatic conditions and forage availability. Males often group together in bachelor herds during rutting season and may travel into different areas from their typical home range to mate.

Occurrence Records

The species is not tracked by the CNDDB; however, there are numerous sightings of the species within 5 miles of the Project study area. In addition, location data from an unpublished CDFW radio telemetry study has shown that males have migrated through the Project study area during rutting season. Therefore, the species is known to occur within the Project study area.

Suitable Habitat within the Project Study Area

The Project study area provides suitable dispersal and foraging habitat for the species in areas supporting grasslands, woodlands, scrub/shrub habitats, and riparian areas. Although SR 152 acts as a barrier to dispersal for the species in the Pacheco Pass area, the species is known to occur both north and south of the highway. Within the Project study area, there is a total of approximately 47 acres of habitat for tule elk.

San Joaquin Kit Fox

Distribution, Biology, and Habitat Requirements

San Joaquin kit fox is listed as endangered under the federal ESA and threatened under CESA. San Joaquin kit foxes are the smallest fox in North America, with an average body length of 20 inches and weight of about 5 pounds (USFWS 1998b). Currently, they occur in some areas of suitable habitat within the San Joaquin Valley and in the surrounding foothills of the Coast Ranges, Sierra Nevada, and Tehachapi Mountains from Kern County north to Contra Costa, Alameda, and San Joaquin Counties. Historically, San Joaquin kit fox was believed to range from Contra Costa and San Joaquin Counties in the north to Kern County in the south.

San Joaquin kit fox occur in a variety of habitats, including grasslands, scrublands, vernal pool areas, alkali meadows and playas, and an agricultural matrix of row crops, irrigated pastures, orchards, vineyards, and grazed annual grasslands. They prefer habitats with loose-textures soils that are suitable for digging, but they occur on virtually every soil type (USFWS 1998b). In addition, they primarily occur on flat or gently rolling terrain, usually with slopes less than five percent. This is due to an increase in predation risk as terrain becomes steeper and more rugged (Cypher et al. 2013). Dens are generally located in open areas with grass or grass and scattered brush, and seldom occur in areas with thick brush. They feed primarily on small mammals including California ground squirrels (*Otospermophilus beecheyi*), rabbits (*Sylvilagus* spp.), mice (*Chaetodipus* and *Perognathus* spp.), kangaroo rats (*Dipodomys* spp.), and have been known to prey on ground-nesting birds, reptiles and insects.

Occurrence Records

The Project study area is located within the range of the San Joaquin kit fox and there are three CNDDB occurrences within 5 miles of the Project study area. The nearest extant CNDDB occurrence (#45, observed 8/2/2002 and updated 9/19/2002) is known from less than one mile west of the Project study area in mixed woodland and grazed annual grassland habitats, just north of SR 152 along Kaiser-Aetna Road.

Suitable Habitat within the Project Study Area

The Project study area provides suitable dispersal habitat (i.e., habitats for movement and foraging) for San Joaquin kit fox. Based on the vegetation mapping efforts and the reconnaissance-level habitat assessment surveys within the Project study area there is less than 0.01 acres of suitable dispersal habitat (i.e., grassland areas with slopes of less than five percent) and approximately 0.2 acre of low or unsuitable dispersal habitat (i.e., grassland areas with slopes between five to 15 percent). There is also approximately 15 acres of grassland that is unsuitable (i.e., grassland areas with slopes greater than 15 percent) dispersal habitat within the Project study area. Although habitat for this species does occur, this species typically inhabits burrows on slopes less than five percent. Habitat suitability declines as terrain ruggedness and average slope increase, primarily due to an associated increase in predation risk for San Joaquin kit foxes. Also, this species is optimally adapted to arid environments with sparse vegetation and a high proportion of bare ground, causing suitability to decrease with an increase in vegetation density (Cypher et al. 2013). Therefore, San Joaquin kit fox has a low potential to occur within the Project study area.

American Badger

Distribution, Biology, and Habitat Requirements

The American badger is considered an SSC by CDFW. Badgers measure approximately 18 to 22 inches long, with a tail measuring between 4 to 6 inches. They weigh 13 to 25 pounds with males being larger than the females. Badgers have a flattened body with short, stocky legs and the fur on their back and sides range from yellowish gray to reddish with a buffy colored belly. Their face is very distinct with a whitish throat and chin and a median white stripe from the nose over the top of the head. Their face has black patches with black spot in front of each ear. They have black feet with five toes and extremely long claws.

The American badger can be found throughout most of California excluding the northern extent of the north coast area. The American badger requires sufficient food, friable soils, and relatively open, uncultivated ground. Grasslands, savannas, and mountain meadows near timberline are preferred. Badgers prey primarily on burrowing rodents such as ground squirrels and pocket gophers but will prey on a variety of other animals.

Occurrence Records

There are five CNDDB occurrences within 5 miles of the Project study area, and the nearest extant CNDDB occurrence (#386, observed 4/23/2006 and updated 12/18/2006) is known from approximately 2.5 miles east of the Project study area in oak woodland/savannah habitat.

Suitable Habitat within the Project Study Area

The Project study area is located within the range of the species and provides suitable habitat for the species in the form of denning and dispersal. Suitable habitat for this species occurs throughout the Project study area but is primarily upstream of North Fork Dam. Within the Project study area there is approximately 20 acres of dispersal habitat (riparian forest and woodland) and approximately 16 acres of potential denning habitat (i.e., grasslands). The Project study area also provides suitable habitat for many prey species for the American badger. Based on the potential habitat within the Project study area and documented occurrences of American badger within 5 miles of the Project study area, this species has a moderate potential to occur.

Dusky-footed Woodrat

Distribution, Biology, and Habitat Requirements

The dusky-footed woodrat is considered a SSC by CDFW. Measuring up to 16 inches long (including tail) and weighing up to 11 ounces, the dusky-footed woodrat has a dark brown back, brown to orange-brown sides, and a white or buff belly (Reid 2006). The species is distinguishable from other woodrats by brown patches of fur above its hind feet, unlike other species that have white patches.

Dusky-footed woodrat frequents forest habitats of moderate canopy cover with dense to moderate understories. The species has a mainly woody plant diet, and mainly feeds on live oak, maple, coffeeberry, alder and elderberry plants. Other food sources include fungi, forbs, grasses, and acorns. Like other woodrats, dusky-footed woodrat nests within constructed stick houses that can contain grasses, leaves, and other materials (e.g., feathers) (CDFW 2014).

Occurrence Records

The nearest CNDDB occurrence is approximately 22 miles northwest from the Project study area in the vicinity of Morgan Hill (#30, observed 06/01/2012).

Suitable Habitat within the Project Study Area

The Project study area is located within the range of the species and provides suitable habitat for the species. Within the Project study area, there is approximately 25 acres of habitat associated with

woodland, riparian forest, scrub/shrub vegetation communities. Based on the potential habitat within the Project study area for dusky-footed woodrat, this species has a moderate potential to occur.

Ringtail

Distribution, Biology, and Habitat Requirements

Ringtails are designated as an FP species by CDFW. The ringtail is a cat-sized carnivore resembling a small fox with a long racoon-like tail. Its bushy tail is flattened and nearly as long as the head and body, with alternating black and white rings. They are almost wholly nocturnal and spend most of the day sleeping in their dens. They leave their dens at night to feed.

They are found throughout most of California, from below sea level to at least 8,000 feet in the Sierra Nevada mountains. They primarily occur in riparian habitats, but also utilize brush stands within forest and shrub habitats. Suitable denning habitat includes rock recesses, hollow trees, logs, snags, abandoned burrows and woodrat nests (CDFW 2014). Females give birth in May and June, averaging one to five kittens per litter. Ringtails feed on a variety of prey including birds, rodents, reptiles and amphibians.

Occurrence Records

This species is not tracked by any state database (i.e., CNDDB), and there are no known occurrences of the species within 5 miles of the Project study area.

Suitable Habitat within the Project Study Area

The Project study area is located within the range of the species and provides suitable habitat for this species. Within the Project study area there is approximately 25 acres of denning habitat associated with woodland, riparian forest, scrub/shrub vegetation communities. Based on the potential habitat within the Project study area for ringtail, this species has a moderate potential to occur.

Pallid Bat, Townsend's Big-Eared Bat, Western Mastiff Bat, and Western Red Bat

Habitat Requirements

The Project study area is within the species range for several bat species that are considered CDFW SSC species. These bat species include pallid bat, Townsend's big-eared bat, western mastiff bat, and western red bat. These species roost and forage in a variety of vegetation communities as well as in buildings, bridges, trees, tree cavities, caves, mines, and cliff faces. Young for all four of these bat species are born typically between April and July with the young being volant by July and August (CDFW 2014).

Occurrence Records

There is one CNDDB occurrence for pallid bat and Townsend's big-eared bat within 5 miles of the Project study area. No CNDDB occurrences of western mastiff bat or western red bat were documented within 5 miles of the Project study area. Table 3-4 below provides the CNDDB occurrences for the special-status bat species.

Table 3-4. Special-Status Bat Species CNDDB Occurrences within 5 Miles of the Project Study Area

Species	CNDDB Occurrence
Pallid bat	One historical CNDDB occurrences (#250) just outside the Project study area from 1937 and updated 10/3/2006 located near SR 152 and Kaiser-Aetna Road.
Townsend's big-eared bat	There is one CNDDB occurrence documented within 5 miles of the Project study area. The occurrence (#649, observed 9/26/1995) is located underneath the Pacheco Creek bridge just outside the Project study area.

Suitable Habitat within the Project Study Area

The Project study area is within the range for all four bat species and provides suitable habitat for these species. Within the Project study area there is approximately 25 acres of potential roosting habitat in the form of woodlands, riparian forest, scrub and shrub vegetation communities. Based on suitable roosting and foraging habitat within the Project study area and documented CNDDB occurrences, the pallid bat, western mastiff bat, and western red bat have a moderate potential to occur, and the Townsend's big-eared bat has a high potential to occur within the Project study area.

Conclusions

Based on the results of the biological surveys and separate Project TMs, Table 4-1 describes each species, suitable habitat within the Project study area, and the associated acreages.

Table 4-1. Summary of Special-Status Species Habitat and Acreages within the Project Study Area

Species Name	Habitat Type	Acreages[1]
Insects		
Monarch butterfly	breeding and migration habitat	54.0
Crotch bumble bee	foraging, overwintering and nesting habitat	54.0
Herpetofauna		
Foothill yellow-legged frog	Aquatic breeding habitat	0.1
	Dispersal habitat	<0.1
Western pond turtle	Aquatic dispersal habitat	6.6
	Dispersal habitat	23.8
	Nesting habitat	23.6
Silvery legless lizard	Breeding/foraging	41.2
San Joaquin coachwhip	Breeding/foraging	21.8
Coast horned lizard	Breeding/foraging	41.2
Birds		
Grasshopper sparrow	Nesting and foraging	21.8
Tricolored blackbird	Foraging	16.3
Long-eared owl	Nesting and foraging	19.4
Western burrowing owl	Foraging	16.3
Swainson's hawk	Nesting and foraging	41.2
Vaux’s swift	Foraging	41.2
Northern harrier	Nesting and foraging	16.3
Olive-sided flycatcher	Foraging	41.2
Yellow warbler	Nesting and foraging	<0.1
White-tailed kite	Nesting and foraging	41.2
California condor	Foraging	41.2
American peregrine falcon	Foraging	41.2
Yellow-breasted chat	Nesting and foraging	<0.1
Loggerhead shrike	Nesting and foraging	21.8
Purple martin	Nesting and foraging	19.4
Least Bell’s vireo	Foraging	<0.1

Species Name	Habitat Type	Acreages[1]
Mammals		
Mountain lion	Foraging	47.3
Tule elk	Foraging	47.3
San Joaquin kit fox	Suitable dispersal	<0.1
	Low or unsuitable dispersal	0.2
American badger	Dispersal	19.4
	Denning/dispersal	16.3
Dusky-footed woodrat	Denning	25.0
Ringtail	Denning	25.0
Bats	Roosting and foraging	25.0

Notes:
[1] Habitat acreages are not cumulative.

References

Bechard, Marc J., C. Stuart Houston, Jose H. Sarasola and A. Sidney England. 2010. Swainson's Hawk (Buteo swainsoni), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology. Available at: http://bna.birds.cornell.edu/bna/species/265. Accessed January 2024.

Bumble Bee Watch. 2023. Highlights--Cali Bumble Bee Atlas - California Bumble Bee Atlas. Available online at: https://www.cabumblebeeatlas.org/project-highlights.html. Accessed February 2024.

Bumble Bee Watch. 2024. Available at: https://www.bumblebeewatch.org/app/#/bees/lists. Accessed February 2024.

CDFW (California Department of Fish and Wildlife). 2014. California Wildlife Habitat Relationships System. California Interagency Wildlife Task Group. Available at: https://wildlife.ca.gov/Data/CWHR/Life-History-and-Range. Last Accessed: December 2020.

_____. 2016. Five-year Status Review of the Swainson's Hawk (*Buteo swainsoni*) in California. Available at: https://wildlife.ca.gov/Conservation/Birds/Swainsons-Hawk. Accessed January 2024.

_____. 2019. Report to the Fish and Game Commission. Evaluation of the petition from the Xerces Society, Defenders of Wildlife, and the Center for Food Safety to list four species of bumble bees as endangered under the California Endangered Species Act. April 4, 2019. Available at: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=166804&inline. Accessed February 2024.

_____. 2023. Tule Elk. Available at: https://wildlife.ca.gov/Conservation/Mammals/Elk/Tule-Elk. Last Accessed: December 2023.

Cypher, B.L., S.E. Phillips, & P.A. Kelly. 2013. Quantity and distribution of Suitable Habitat for Endangered San Joaquin Kit Foxes: Conservation Implications. Canid Biology & Conservation 16(7): 25-31. Available at: http://www.canids.org/CBC/16/San_Joaquin_kit_fox_habitat_suitability.pdf. Last Accessed: December 2020.

Ernst, Carl H., Roger W. Barbour, & Jeffrey E. Lovich. 2009. *Turtles of the United States and Canada*. Smithsonian Institution 1994. (2nd Edition)

Goldberg, Stephen R., and Charles M. Miller. 1985. "Reproduction of the Silvery Legless Lizard, Anniella Pulchra (Anniellidae), in Southern California." *The Southwestern Naturalist*, vol. 30, no. 4, 1985, pp. 617–619. *JSTOR*, www.jstor.org/stable/3671066. Accessed 11 Dec. 2020.

H.T. Harvey and Associates. 2020. Pacheco Creek Restoration Project Final Feasibility Study. August 10, 2020.

iNaturalist. 2023. Crotch's Bumblebee Observations. Available at: inaturalist.org. Accessed February 2024.

Lind, A. J., H. Welsh, Jr., and R. A. Wilson. 1996. The effects of a dam on breeding habitat and egg survival of the foothill yellow-legged frog (Rana boylii) in northwestern California. Herpetological Review 27:62–67.

Moyle, P. B. 1973. Effects of introduced bullfrogs, *Rana catesbeiana*, on the native frogs of the San Joaquin Valley, California. Copeia 1973:18–22.

Olsen, Deanna and Davis, Raymond. 2009. *Conservation Assessment for the Foothill Yellow-legged Frog (Rana boylii) in Oregon*. U.S.D.A Forest Service Region 6 and U.S.D.I Bureau of Land Management Interagency Special Status Species Program. April 22, 2009.

Pathways for Wildlife. 2020. Wildlife Permeability and Hazards across Highway 152 Pacheco Pass: Establishing a Baseline to Inform Infrastructure and Restoration. Santa Clara Valley Habitat Agency. February 2020.

Reid, F.A. 2006. Peterson Field Guide to Mammals of North America, 4th Edition. Houghton Mifflin Company: Boston and New York, 608 pp.

Santa Clara County. 2012. Santa Clara Valley Habitat Conservation Plan/Natural Community Conservation Plan (HCP/NCCP). Available at: http://www.scv-habitatplan.org/www/default.aspx.

Sawyer, J.O., T. Keeler-Wolf, and J.M. Evens. 2009. A Manual of California vegetation, 2nd edition. California Native Plant Society, Sacramento, California.

Spinks, P.Q., R.C. Thomson, and H.B. Shaffer. 2014. The advantages of going large: genome wide SNPs clarify the complex population history and systematics of the threatened western pond turtle. Molecular Ecology. 23(9): 2228-2241. June 2014.

Stebbins, R. C. 1985. A field guide to western reptiles and amphibians, Houghton Mifflin Company, Boston, MA. 336 pp.

Center for Biological Diversity, Center for Food Safety, The Xerces Society, B. Lincoln. 2014. Petition to Protect the Monarch Butterfly (*Danaus plexippus plexippus*) Under the Endangered Species Act. Submitted August 26, 2014. https://ecos.fws.gov/docs/tess/petition/814.pdf. Last Accessed: December 2020.

The Xerces Society for Invertebrate Conservation, Defenders of Wildlife, Center for Food Safety. 2018. A Petition to the State of California Fish and Game Commission to List The Crotch bumble bee (Bombus crotchii), Franklin's bumble bee (Bombus franklini), Suckley cuckoo bumble bee (Bombus suckleyi), and western bumble bee (Bombus occidentalis occidentalis) as Endangered under the California Endangered Species Act. https://fgc.ca.gov/CESA. Last Accessed: December 2018.

USFWS (U.S. Fish and Wildlife Service). 1998a. Recovery Plan for Serpentine Soil Species of the San Francisco Bay Area. California/Nevada Operation Office, Region 1. Available online on April 15, 2008 at http://ecos.fws.gov/docs/recovery_plans/1998/980930c.pdf

_____. 1998b. Recovery plan for the upland species of the San Joaquin Valley, California. September 30, 1998.

_____. 2009. Bay Checkerspot Butterfly 5-Year Review: Summary and Evaluation. Sacramento Fish and Wildlife Office. Sacramento, California.

https://ecos.fws.gov/docs/five_year_review/doc2517.pdf. Last Accessed: December 2020.

U.S. Geological Survey. 2024. Species observations for the United States and Territories. Available at: gbif.us. Last Accessed: February 2024.

Western Association of Fish and Wildlife Agencies. 2019. Western monarch butterfly conservation plan, 2019–2069. Version 1.0. January 2019.

Yap, T., B. Cummings, J. P. Rose. 2019. A Petition to List the Southern California/Central Coast Evolutionarily Significant Unit (ESU) of Mountain Lions as Threatened under the California Endangered Species Act (CESA). https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=171208&inline. Last Accessed: December 2020.

Appendix D: Biological Resources

Pacheco Reservoir Expansion Project Design Level Geotechnical Investigations

Attachment 2 - Terrestrial Habitat Mapping

Describes the terrestrial habitat types present in the upstream and downstream area. Habitat types have been classified into fine-scale vegetation communities per the Manual of California Vegetation, and other land cover types (e.g., urban, agriculture, water).

- Exhibit 2A - Vegetation Communities and Other Habitat Types Map Figures
- Exhibit 2B - Vegetation Alliances and Associations and Other Land Cover Types in the Project Study Area by Project Component



Attachment 2 - Terrestrial Vegetation Communities Mapping

Pacheco Reservoir Expansion Project Design Level Geotechnical Investigations

June 2024

Prepared by:

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Prepared for:

Valley Water

Valley Water Project Number: 91954002

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Exhibit 2A. Vegetation Communities and Other Habitat Types Map Figures

Exhibit 2B. Vegetation Alliances and Associations and Other Land Cover Types in the Project Study Area by Project Component

Acronyms and Abbreviations

AC	absolute cover
CDFW	California Department of Fish and Wildlife
MCV	A Manual of California Vegetation
%	percent
PREP	Pacheco Reservoir Expansion Project
Project	Design Level Geotechnical Investigations
RC	relative cover
Report	Terrestrial Vegetation Communities Mapping Report

Chapter 1. Introduction

This attachment to the Biological Resources Appendix (Attachment 2 - Terrestrial Habitat Mapping) was prepared in support of the Design Level Geotechnical Investigations (Project) that are proposed in support of the Valley Water's Pacheco Reservoir Expansion Project (PREP) and describes the terrestrial habitat types in the Project study area. For the purposes of this attachment, broad habitat types have been further classified into fine-scale vegetation communities and other land cover types (e.g., urban, agriculture, water). This level of habitat mapping provides sufficient detail to support the development of environmental documents and permits necessary to implement the proposed Project. The results of the terrestrial habitat mapping have been used to develop the discussion of impacts of the proposed Project on vegetation, including impacts to sensitive natural communities as defined by the California Department of Fish and Wildlife (CDFW).

Chapter 2. Methods

2.1 Study Area

The Project study area for the purposes of this attachment is the same as the Project footprint. The Project study area encompasses approximately 55 acres and includes all activity areas associated with the proposed Project (e.g., access routes, borings, test pits).

2.2 Survey and Mapping Methodology

Botanists initially conducted desktop-level assessments to characterize vegetation communities based on aerial photograph signatures. Following this initial assessment, pedestrian field surveys were performed to verify and characterize the vegetation communities and other land cover types in the study area (Figure 2-1). Pedestrian surveys were initially performed on the days identified in Table 2-1 between February 2019 and August 2020 within the vicinity of North Fork Dam and upstream areas that including the dam footprint, inundation area with surrounding and borrow sites associated with PREP. Portions of the previously mapped PREP study area were further refined as part of pre-activity surveys in support of geotechnical investigations that occurred in September through November of 2022. After permission to enter was provided, additional pedestrian surveys were conducted within the PREP study area along the proposed PREP frontage road between April and August 2023.

Table 2-1. Pacheco Reservoir Expansion Project Terrestrial Vegetation Communities Mapping Field Survey Dates

Month	Year and Days			
	2019	2020	2022	2023
February	4-8, 18-22			
March		16-20, 23-27, 30-31		30-31
April		1-3, 6		
May	21-22	4-8, 11-15, 18-22		1, 9, 15
June				5, 21, 28
July		20-24, 27-31		5, 11, 15, 18, 20, 21, 31
August	8-9, 19-23, 26-30	3-7, 10-14		3-4, 7, 11, 29
September	9-13, 16-18		21, 23, 27	
October			5-7, 12-14, 17, 19, 21, 24, 31	
November			1, 2, 7	

Vegetation communities mapping followed the technical approach and vegetation alliance classification system described in A Manual of California Vegetation, 2nd Edition (MCV) (Sawyer et al. 2009) and updated in the current online edition (California Native Plant Society 2023). The MCV represents the most recent efforts to provide a common and accepted vegetation

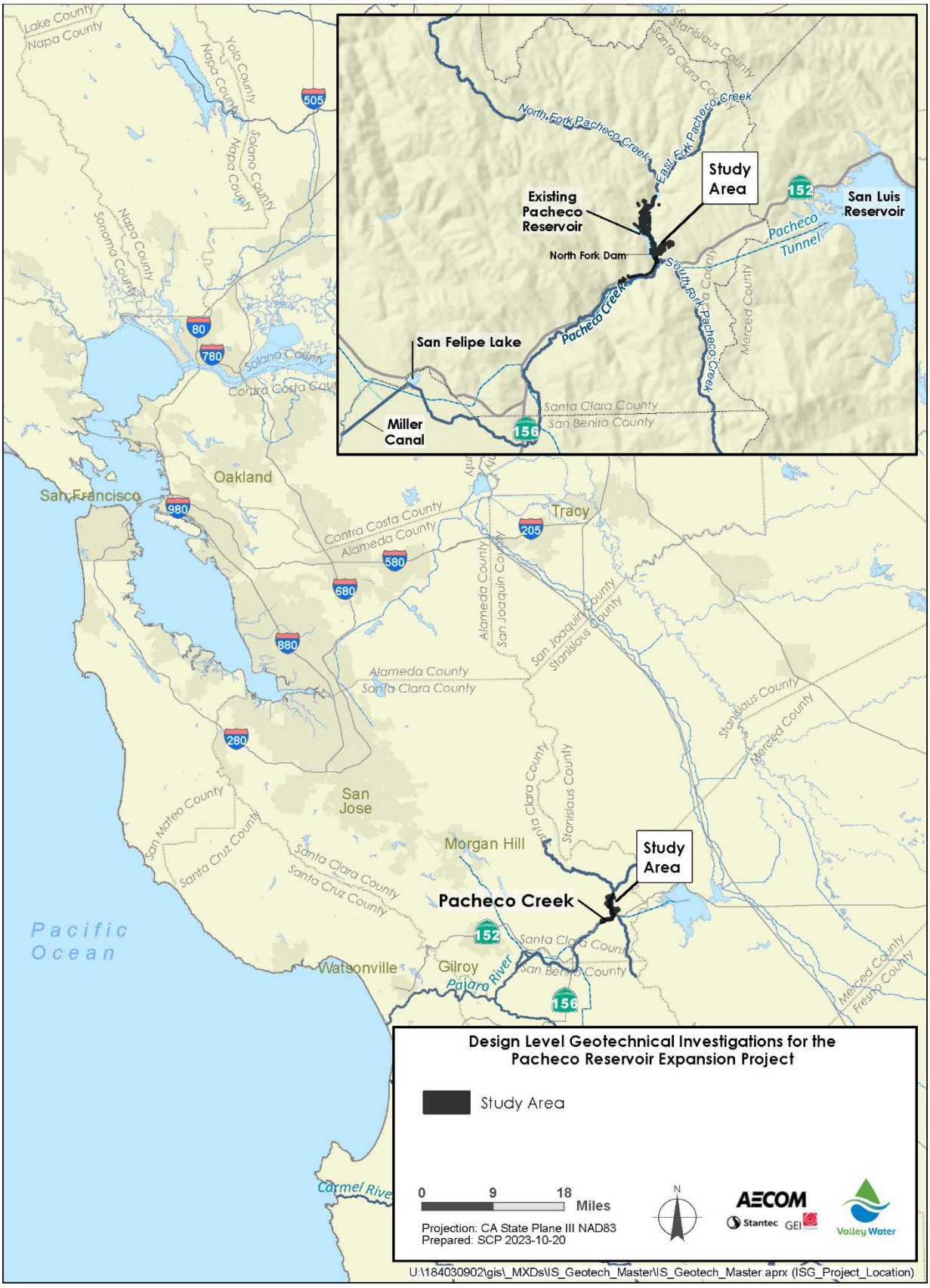


Figure 2-1. Vegetation Communities Mapping Project Study Area

classification system for use by CDFW and other agencies throughout California and classifies vegetation into a set of plant alliances, associations, special stands, or semi-natural stands.

A plant species' dominance or importance in the stratum (i.e., tree, woody shrub/subshrub, or non-woody herbaceous) with the greatest amount of relative cover (RC) generally determines the vegetation alliance classification. RC refers to the proportion of a plant species' canopy cover in relation to the total areal plant cover within a vegetation canopy layer. Associations represent a finer scale of classification than alliances and are often defined by a range of species which co-occur due to local ecological conditions. Stand is a generic term used to describe a unit of vegetation that grows together due to uniform environmental conditions. In the MCV, special stands are typically defined by the presence of special-status species and semi-natural stands are dominated by invasive or non-native plant species (California Native Plant Society 2023). Percent (%) RC pertains to the dominant, co-dominant, or sub-dominant species in each canopy stratum and not to the overall vegetation cover within a stand. This usage of % RC corresponds to the MCV guidelines and membership rules for classification. Percent absolute cover (AC) is referred to in limited situations to further describe the distribution of species across a stand.

The mapping effort included identifying and documenting all CDFW California Sensitive Natural Communities in the Project study area. Sensitive natural communities as defined by CDFW are those with a state rarity ranking of S1 (critically imperiled), S2 (imperiled), or S3 (vulnerable). To identify sensitive natural communities within the study area, each vegetation community identified during field mapping was checked against the California Natural Community List dated June 1, 2023 (CDFW 2023). Plant taxonomy generally follows Baldwin et al. (2012), including applicable errata and supplements (Jepson Flora Project 2023). Differences between the taxonomy used in the MCV compared to the Baldwin et al. (2012) are noted where applicable.

Botanists mapped vegetation in the field by walking through accessible areas of the PREP study area[1] and assessing vegetative cover within stands. Stands were classified to the alliance level, or association level when an association was present. During field surveys, common assemblages of plant species were identified and recorded on field maps or global positioning system-enabled tablets with aerial background imagery. Botanists collected a combination of point and polygon data to document the field-verified vegetation classifications. Information documenting each mapped vegetation community included: plant species composition (i.e., percent RC of dominant and sub-dominant species within each stratum), stand structure, regional occurrence, and other notable characteristics. In areas without cellular phone reception, these data were recorded in the field, and the corresponding alliance or association was assigned later using ArcGIS software.

The vegetation community boundaries were delineated using ArcGIS software for display and data query purposes. Vegetation community polygons were generally delineated with a minimum mapping unit of 0.5 acre. Polygons less-than 0.5 acre were created in limited situations for sensitive natural communities, noteworthy habitats (e.g., ponds), or if the vegetation community continued outside of the study area boundary. Digital vegetation classification was conducted using National Agricultural Imagery Program imagery from 2016, , 2018, and 2020, and other publicly available aerial imagery sources (e.g., Google, Santa Clara County).

A limited number of vegetation communities were encountered in the Project study area that are not currently described in the MCV. As a result, those vegetation communities have been described in this attachment as new alliance or association types. These new alliances and

[1] Project tudy area is encompassed by the much larger PREP study area.

associations have been described by classifying dominant and sub-dominant vegetation and by assessing repeated plant species composition across the study area. Botanists assessed the status of new vegetation communities as sensitive natural communities based on existing CDFW classifications when possible. Undescribed alliances dominated by non-native species are not considered sensitive natural communities. Per CDFW guidance, undescribed alliances and associations dominated by native species were classified to a corresponding vegetation type and listing status provided in Preliminary Descriptions of the Terrestrial Natural Communities of California (Holland 1986) to the extent possible.

Vegetation communities and other land cover types in the Project study area were also assigned to the corresponding land cover types described in the Santa Clara County Habitat Plan (Santa Clara Valley Habitat Agency 2012). The Santa Clara County Habitat Plan used 10-acre minimum mapping unit to classify most land cover types compared to the 0.5-acre minimum mapping unit used for the vegetation classification described in this attachment. As such, multiple vegetation communities (i.e., alliances or associations) described may be comparable to a single land cover type described in the Santa Clara County Habitat Plan.

Chapter 3. Results

Each of the vegetation communities and other land cover types mapped within the Project study area is listed in Table 3-1, and each of the identified alliances and other land cover types are described in detail following this table. Exhibit 2B lists the vegetation communities and their acreages within each activity area that comprise the Project study area and the vegetation community/other land cover types listed in Table 3-1. The detailed descriptions of the vegetation communities are listed by stratum (i.e., tree, shrub, herb). Alliance descriptions are based on plant community characteristics observed in the Project study area and do not represent an exhaustive description of these alliances. The locations of all vegetation communities and other land cover types in the Project study area is shown in the Vegetation Communities and Other Land Cover Types Map Figure included as Exhibit 2A. The Map ID column in Table 3-1 identifies the numerical label of each vegetation community and other land cover type. The first page of Exhibit 2A includes a table which serves as the legend for the vegetation communities shown in the figure.

Table 3-1. Vegetation Alliances and Associations and Other Land Cover Types in the Project Study Area

Alliance[1]	Association[1]	Sensitive Natural Community	Santa Clara Valley Habitat Plan Land Cover Type	Map ID	Area (Acres)
Forests and Woodlands					
California buckeye groves	*Aesculus californica*	Yes	Mixed evergreen forest	12	0.049
California sycamore woodlands	No Association	Yes	Central California sycamore alluvial woodland and mixed riparian forest and woodland	67	0.057
	Platanus racemosa – Quercus agrifolia	Yes	Central California sycamore alluvial woodland and mixed riparian forest and woodland	67.1	0.012
Coast live oak woodland	*Quercus agrifolia*	No	Coast live oak forest and woodland	78	0.958
	Quercus agrifolia / Adenostoma fasciculatum – (*Salvia mellifera*)	Yes	Coast live oak forest and woodland	78.2	0.057
	Quercus agrifolia / Artemisia californica	No	Coast live oak forest and woodland	78.3	0.829
	Quercus agrifolia / grass	No	Coast live oak forest and woodland	78.4	2.578
	Quercus agrifolia / Toxicodendron diversilobum	No	Coast live oak forest and woodland	78.5	0.094
	Quercus agrifolia – Umbellularia californica / Toxicodendron diversilobum	No	Coast live oak forest and woodland	78.7	3.175
Blue oak woodland	*Quercus douglasii / Artemisia californica*[2]	No[2]	Blue oak woodland	80.1	1.159
	Quercus douglasii – Aesculus californica / grass	No	Blue oak woodland	80.2	0.224
	Quercus douglasii – Pinus sabiniana	No	Blue oak woodland	80.3	0.829
	Quercus douglasii – Quercus agrifolia	No	Blue oak woodland	80.4	1.511
	Quercus douglasii – Mixed herbaceous	No	Blue oak woodland	80.7	5.331
Valley oak woodland	*Quercus lobata – Quercus agrifolia* / grass	Yes	Valley oak woodland	84.1	0.387
	Quercus lobata / grass	Yes	Valley oak woodland	84.4	2.038

Alliance[1]	Association[1]	Sensitive Natural Community	Santa Clara Valley Habitat Plan Land Cover Type	Map ID	Area (Acres)
Goodding's willow – red willow riparian woodlands	*Salix laevigata – Salix lasiolepis*	Yes	Willow riparian forest and scrub	520.1	0.057
Shrublands					
California sagebrush scrub	*Artemisia californica – Diplacus aurantiacus*	Yes	Northern coastal scrub/Diablan sage scrub	136.1	0.218
	Artemisia californica	No	Northern coastal scrub/Diablan sage scrub	136.2	1.949
California sagebrush – black sage scrub	*Artemisia californica – Salvia mellifera*	No	Northern coastal scrub/Diablan sage scrub	138	0.448
Coyote brush scrub	*Baccharis pilularis – Artemisia californica*	No	Northern coastal scrub/Diablan sage scrub	151	0.119
California buckwheat	*Eriogonum fasciculatum*	No	Northern coastal scrub/Diablan sage scrub	203	1.627
Holly leaf cherry – toyon – greenbark ceanothus chaparral	*Prunus ilicifolia* ssp. *ilicifolia*	Yes	Northern mixed chaparral/chamise chaparral	525	0.391
	Prunus ilicifolia ssp. *ilicifolia – Fraxinus dipetala*	Yes	Northern mixed chaparral/chamise chaparral	525.1	0.022
Black sage scrub	*Salvia mellifera*	No	Northern coastal scrub/Diablan sage scrub	293	0.533
Poison oak scrub	*Toxicodendron diversilobum*	No	Northern mixed chaparral/chamise chaparral	301	0.281
Herbaceous					
Wild oats and annual brome grasslands	*Avena* spp. – *Bromus* spp.	No	California annual grassland	535	13.494
	Avena barbata	No	California annual grassland	535.1	0.855
Yellow star-thistle fields	*Centaurea solstitialis*	No	California annual grassland	368	0.428
Needle grass – melic grass grassland	No Association	Yes	Non-serpentine native grassland	536	0.007
	Nassella pulchra – Avena spp. – *Bromus* spp.	Yes	Non-serpentine native grassland	536.1	1.363
	Nassella pulchra – Melica californica	Yes	Non-serpentine native grassland	536.3	0.114
Other Land Cover Types					
Non-vegetated areas[3]	Water (Reservoir)	No[3]	Reservoir	902	12.785
Urban[3]	Urban (Barren)	No[3]	Barren	901	0.506
	Urban (Rural residential)	No[3]	Rural residential	901.1	0.631
	Urban (Urban-Suburban)	No[3]	Urban-suburban	901.3	0.042

Alliance[1]	Association[1]	Sensitive Natural Community	Santa Clara Valley Habitat Plan Land Cover Type	Map ID	Area (Acres)
				TOTAL	**55.153**

Notes:
[1] A Manual of California Vegetation, 2nd Edition (Sawyer et al. 2009).
[2] Not described in A Manual of California Vegetation or in Holland (1986). Insufficient data to determine sensitivity.
[3] Not described in A Manual of California Vegetation and dominated by non-native species, or agriculture, non-vegetated, or urban areas.

3.1 Forests and Woodlands

3.1.1 California Buckeye Groves

California buckeye groves alliance occurs in the Project study area in a relatively mesic area on a north-facing slope adjacent to North Fork Pacheco Creek. The tree canopy in this grove is heavily dominated by California buckeye (*Aesculus californica*) (70–90% RC) with low cover of California bay (*Umbellularia californica*), coast live oak (*Quercus agrifolia*), or foothill pine (*Pinus sabiniana*) in some stands. The understory is relatively sparse with low cover of shrubs such as poison oak (*Toxicodendron diversilobum*) or scrub oak (*Quercus berberidifolia*). The understory is generally dominated by non-native annual grasses. One California buckeye groves association is present in the Project study area: *Aesculus californica*. CDFW considers California buckeye groves to be a sensitive natural community.

3.1.2 California Sycamore Woodlands

California sycamore woodlands alliance is associated with seasonal drainages and floodplains in the study area, both upstream and downstream from Pacheco Reservoir. California sycamore woodland occurs as a narrow stringer of vegetation along North Fork Pacheco Creek which includes California sycamore (*Platanus racemosa*) (30–50% RC) that is mixed and co-dominant with coast live oak.

California sycamore alluvial woodlands occurs within or in close proximity to the Project study area adjacent to North Fork Pacheco Creek downstream of North Fork Dam and along South Fork Pacheco Creek. In contrast to the California sycamore woodlands (described above) that occur in the narrow intermittent stream channels, the sycamore woodlands that occur in the wider alluvial channels and floodplains are generally dominated by widely spaced California sycamores (5–20% AC) with barren alluvial substrates, mulefat (*Baccharis salicifolia*), or non-native annual grasses dominating the understory.

California sycamore woodland were characterized to the alliance level and two associations: *Platanus racemosa*, *Platanus racemosa – Quercus agrifolia* were characterized. CDFW considers the California sycamore woodlands alliance and all associations to be sensitive natural communities.

3.1.3 Coast Live Oak Woodland

Coast live oak woodland alliance stands are most common on the slopes around Pacheco Reservoir, in the northern portion of the Project study area, and occur along North Fork Pacheco Creek downstream North Fork Dam. Coast live oak woodland stands are dominated by coast live oak (> 50% RC) and occur both on xeric slopes and in mesic areas on north-slopes and in riparian corridors. Mixed stands commonly occur with trees such as California bay. The understory of these woodlands may be dominated by non-native annual grasses or by shrubs such as California sagebrush (*Artemisia californica*), chamise (*Adenostoma fasciculatum*), or poison oak. Six associations of coast live oak woodland are present in the study area: *Quercus agrifolia*, *Quercus agrifolia* / *Adenostoma fasciculatum* – (*Salvia mellifera*), *Quercus agrifolia* / *Artemisia californica*, *Quercus agrifolia* / grass, *Quercus agrifolia* / *Toxicodendron diversilobum*, and *Quercus agrifolia – Umbellularia californica* / *Toxicodendron diversilobum*. Of the associations mapped in the Project study area, CDFW only considers *Quercus agrifolia* / *Adenostoma fasciculatum* – (*Salvia mellifera*) to be a sensitive natural community. Within the Project study area, the *Quercus agrifolia* / *Adenostoma fasciculatum* – (*Salvia mellifera*) community is associated with an occurrence of the California Rare Plant Rank 1B.2 species Hall's bush mallow (*Malacothamnus arcuatus* var. *elmeri* [syn. *M. hallii*]).

3.1.4 Blue Oak Woodland

Blue oak woodland is a dominant vegetation community on xeric slopes in the vicinity of Pacheco Reservoir. In the Project study area, blue oak woodland most often occurs as open savannas with an understory heavily dominated by non-native annual grasses such as slender oat (*Avena barbata*) or soft brome (*Bromus hordeaceus*) with little to no shrub cover. Stands of blue oak woodland also occur with sub-dominant California buckeye, coast live oak, or foothill pine. Some stands with relatively low cover of blue oak (*Quercus douglasii*) (15–40% AC) also occur in the Project study area with an understory dominated by California sagebrush (20–40% AC). Six associations of blue oak woodland are present in the Project study area: *Quercus douglasii* / mixed herbaceous, *Quercus douglasii* / *Artemisia californica*, *Quercus douglasii – Aesculus californica* / grass*, Quercus douglasii – Pinus sabiniana, Quercus douglasii – Quercus agrifolia*. The *Quercus douglasii* / *Artemisia californica* association was described during the vegetation classification efforts for this Project. This association is not currently described in the MCV and CDFW has not assessed its status as a sensitive natural community. CDFW does not consider the remaining blue oak woodland associations mapped in the Project study area to be sensitive natural communities. Within the Project study area, one occurrence of woodland woolythreads (*Monolopia gracilens*), which is a California Rare Plant Rank 1B.2 species, was observed growing at the edge of this vegetation community in the northern portion of the Project study area.

3.1.5 Valley Oak Woodland

Valley oak woodland alliance occurs in the Project study area on terraces and lower slopes around Pacheco Reservoir near the confluence of North Fork Pacheco Creek and South Fork Pacheco Creek. Valley oak woodlands are heavily dominated by valley oak (40–100% RC) with lower cover of other trees such as coast live oak in some stands. Trees in stands of valley oak woodland are often widely spaced with an understory dominated by non-native annual grasses. Valley oaks in stands associated with riparian habitat along Pacheco Creek are often co-dominant with coast live oak. Botanists mapped two associations of valley oak woodland in the Project study area: *Quercus lobata* / grass and *Quercus lobata – Quercus agrifolia* / grass. CDFW considers all associations in valley oak woodland to be sensitive natural communities.

3.1.6 Goodding's Willow – Red Willow Riparian Woodlands

Goodding’s willow – red willow riparian woodlands alliance is in the Project study area along North Fork Pacheco Creek downstream from North Fork Dam. Stands of Goodding’s willow – red willow riparian woodlands in the Project study area are heavily dominated by red willow (*Salix laevigata*) (50–90% RC) with low to moderate cover of other riparian trees such as black cottonwood (*Populus trichocarpa*), box-elder (*Acer negundo*), Fremont cottonwood (*Populus fremontii*), or California sycamore. The understory is often dominated by arroyo willow (*Salix lasiolepis*). One association in the Goodding’s willow – red willow riparian woodlands alliance is present in the Project study area: *Salix laevigata – Salix lasiolepis*. CDFW considers the association mapped in the Project study area to be a sensitive natural community.

3.2 Shrublands

3.2.1 California Sagebrush Scrub

California sagebrush scrub is one of the most abundant shrub dominated vegetation communities in the Project study area. This alliance occurs on xeric slopes around Pacheco Reservoir within the Project study area. California sagebrush generally dominates these stands (>70% RC). A single stand was mapped where California sagebrush was co-dominant with

sticky monkeyflower (*Diplacus aurantiacus*). Two associations of California sagebrush scrub are present in the Project study area: *Artemisia californica* and *Artemisia californica – Diplacus aurantiacus*. CDFW considers the *Artemisia californica – Diplacus aurantiacus* association to be a sensitive natural community.

3.2.2 California Sagebrush – Black Sage Scrub

California sagebrush – black sage scrub occurs in the Project study area on steep slopes, east of Pacheco Reservoir. Black sage (*Salvia mellifera*) and California sagebrush each occur at 30–60% RC in these stands. Emergent trees such as coast live oak or blue oak are sometimes present in low cover. California sagebrush – black sage scrub was mapped to the alliance level in the Project study area. CDFW does not consider the California sagebrush – black sage scrub alliance to be a sensitive natural community.

3.2.3 Coyote Brush Scrub

Coyote brush scrub occurs in limited portions of the Project study area near North Fork Dam along existing roadways. Coyote brush (*Baccharis pilularis* ssp. *consanguinea*) is co-dominant in these stands with California sagebrush. One association of coyote brush scrub is present in the Project study area: *Baccharis pilularis – Artemisia californica*. CDFW does not consider this association of coyote brush scrub mapped in the Project study area to be a sensitive natural community.

3.2.4 California Buckwheat Scrub

California buckwheat scrub forms stands in the Project study area on disturbed cut and fill slopes along State Route 152. These stands are dominated by California buckwheat (*Eriogonum fasciculatum*) (>60% RC) with lower cover of coyote brush in some stands. The understory is dominated by non-native annual grasses and ruderal forbs. One association of California buckwheat scrub is present in the Project study area: *Eriogonum fasciculatum*. CDFW does not consider the *Eriogonum fasciculatum* association to be a sensitive natural community.

3.2.5 Holly Leaf Cherry – Toyon – Greenbark Ceanothus Chaparral

Holly leaf cherry – toyon – greenbark ceanothus chaparral occurs most commonly on north-facing and other slightly mesic slopes around Pacheco Reservoir and in the northern portions of the Project study area. Some stands also occur on more xeric, exposed slopes. All stands in the Project study area are dominated by holly leaf cherry (*Prunus ilicifolia* ssp. *ilicifolia*) (>50% RC) with some stands having co-dominant two petaled ash (*Fraxinus dipetala*). Shrubs such as redberry (*Rhamnus crocea*) or toyon (*Heteromeles arbutifolia*) are sometimes present in low cover. Stands on more xeric slopes have more widely spaced holly leaf cherry with sub-dominant shrubs such as California sagebrush or chamise. Two associations of holly leaf cherry – toyon – greenbark ceanothus chaparral are present in the study area: *Prunus ilicifolia* ssp. *ilicifolia* and *Prunus ilicifolia* ssp. *ilicifolia – Fraxinus dipetala*. CDFW considers both associations of holly leaf cherry – toyon – greenbark ceanothus chaparral mapped in the Project study area to be sensitive natural communities.

3.2.6 Black Sage Scrub

Black sage scrub occurs in moderate abundance in the Project study area on dry slopes, generally east of Pacheco Reservoir. These stands are dominated by black sage (70–100% RC) and sometimes have lower cover of shrubs such as California sagebrush or holly leaf cherry. Other stands of black sage that are co-dominant with California sagebrush are mapped in the California sagebrush – black sage scrub alliance. One association of black sage scrub has been

documented in the Project study area: *Salvia mellifera*. CDFW does not consider the *Salvia mellifera* association to be a sensitive natural community. Within the Project study area, this community is associated with an occurrence of Hall's bush mallow.

3.2.7 Poison Oak Scrub

Poison oak scrub occurs in low abundance in the Project study area on north-facing slopes west of Pacheco Reservoir. These stands are dominated by poison oak (60–80% RC) with lower cover of other shrubs such as holly-leaf cherry or sticky monkey flower. One association of poison oak scrub is present in the Project study area: *Toxicodendron diversilobum*. CDFW does not consider the *Toxicodendron diversilobum* association to be a sensitive natural community.

3.3 Herbaceous

3.3.1 Wild Oats and Annual Brome Grasslands

Wild oats and annual brome grasslands is one of the most abundant vegetation communities in the Project study area. This alliance is the dominant vegetation community of all upland herbaceous vegetation in the Project study area. Wild oats and annual brome grasslands in the Project study area are dominated by upland grasses such as ripgut brome (*Bromus diandrus*), slender oat, and soft brome. The wild oats and annual brome grasslands were generally mapped to the alliance level, with a limited number of stands mapped to the *Avena barbata* association. CDFW does not consider the wild oats and annual brome grasslands alliance, or any associations, to be sensitive natural communities.

3.3.2 Yellow Star-Thistle Fields

Yellow star-thistle fields were mapped in two relatively small polygons in the Project study area near Pacheco Creek, downstream from North Fork Dam. These herbaceous stands are dominated by yellow star-thistle (*Centaurea solstitialis*) (>50% RC) with sub-dominant non-native annual grasses and low cover of ruderal, native forbs such as gumweed (*Grindelia camporum*) (<10% RC). *Centaurea solstitialis* is the only association of yellow star-thistle fields identified in the Project study area. CDFW does not consider the *Centaurea solstitialis* association to be a sensitive natural community.

3.3.3 Needle Grass – Melic Grass Grassland

Needle grass – melic grass grassland occurs in the Project study area in relatively low abundance on upland slopes in the vicinity of Pacheco Reservoir. Stands are generally dominated by non-native annual grasses such as slender oat or soft brome (40–70% RC) with *Stipa* (a synonym of *Nassella*) species characteristically present at 20–40% RC. Botanists were only able to positively identify the needle grasses to genus in a limited number of stands due to the timing of field surveys conducted in 2019. The species composition of all needle grass – melic grass grassland stands were then verified during comprehensive botanical surveys conducted in support of PREP in 2020, and additional stands were identified within the Project study area during geotechnical investigation pre-activity studies in 2022. Needle grass – melic grass grassland has been mapped to the alliance level and three associations: *Nassella pulchra*, *Nassella pulchra – Avena* spp. – *Bromus* spp. and *Nassella pulchra – Melica californica*. CDFW considers all associations of needle grass – melic grass grassland to be sensitive natural communities.

3.4 Other Land Cover Types

3.4.1 Non-Vegetated Areas

Naturally barren and aquatic habitats were mapped as non-vegetated areas when they did not have enough plant cover to meet the definition of a vegetation type. Non-vegetated areas occur in the Project study area as water (reservoir). CDFW does not consider non-vegetated areas to be sensitive natural communities, although these areas may fall under the jurisdiction of other state and federal regulations.

3.4.2 Urban

Urban areas occur in relatively low abundance, primarily in the downstream portion of the study area near Pacheco Creek. Three different types of urban areas are present in the Project study area: urban (barren), urban (rural residential), and urban (urban-suburban). The urban (barren) classification includes paved road surfaces and other non-vegetated areas associated with urban development. Within the Project study area, these correspond to paved and unpaved roads associated with ranching operations and State Route 152, existing graveled staging areas, and areas devoid of vegetation such as existing dam infrastructure. CDFW does not consider urban areas to be sensitive natural communities.

Chapter 4. References

Baldwin, B.G., D.H. Goldman, D.J. Keil, R. Patterson, T.J. Rosatti, and D.H. Wilken, editors. 2012. The Jepson manual: vascular plants of California, second edition. University of California Press, Berkeley, California.

California Department of Fish and Wildlife. 2023. California Natural Community List, June 1, 2023. Vegetation Classification and Mapping Program. https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=153398&inline. Accessed September 2023.

California Native Plant Society. 2023. A Manual of California Vegetation, Online Edition. http://vegetation.cnps.org. Accessed September 2023.

Holland, R. 1986. Preliminary Descriptions of the Terrestrial Natural Communities of California. State of California. The Resources Agency, California Department of Fish and Game.

Jepson Flora Project. 2023. Jepson eFlora. http://ucjeps.berkeley.edu/eflora/. Accessed September 2023.

Santa Clara Valley Habitat Agency. 2012. Final Santa Clara Valley Habitat Plan. August 2012. Available: http://scv-habitatagency.org/178/Final-Habitat-Plan.

Sawyer, J.O., T. Keeler-Wolf, and J.M. Evens. 2009. A Manual of California vegetation, 2nd edition. California Native Plant Society, Sacramento, California.

Appendix C: Biological Resources

Pacheco Reservoir Expansion Project Design Level Geotechnical Investigations

Attachment 2 - Exhibits 2A and 2B

- Exhibit 2A - Vegetation Communities and Other Habitat Types Map Figures
- Exhibit 2B - Vegetation Alliances and Associations and Other Land Cover Types in the Project Study Area by Project Component

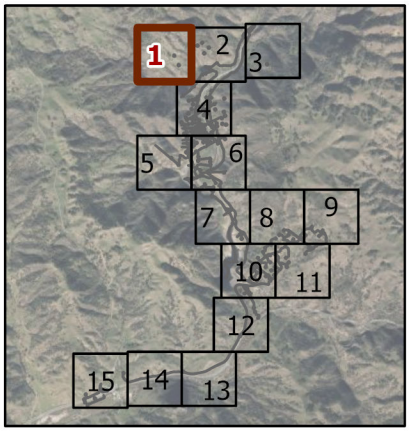
Appendix D: Biological Resources

Pacheco Reservoir Expansion Project Design Level Geotechnical Investigations

Attachment 2 - Terrestrial Habitat Mapping

Exhibit 2A - Vegetation Communities and Other Habitat Types Map Figures





Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

Study Area

Major Highway

Vegetation Communities

535—Avena spp. – Bromus spp.

**Labels with green coloration rather than white are sensitive communities.*

N

0 150 300 Feet

Projection: CA State Plane III NAD83
Prepared: SCP 2024-05-15

Valley Water

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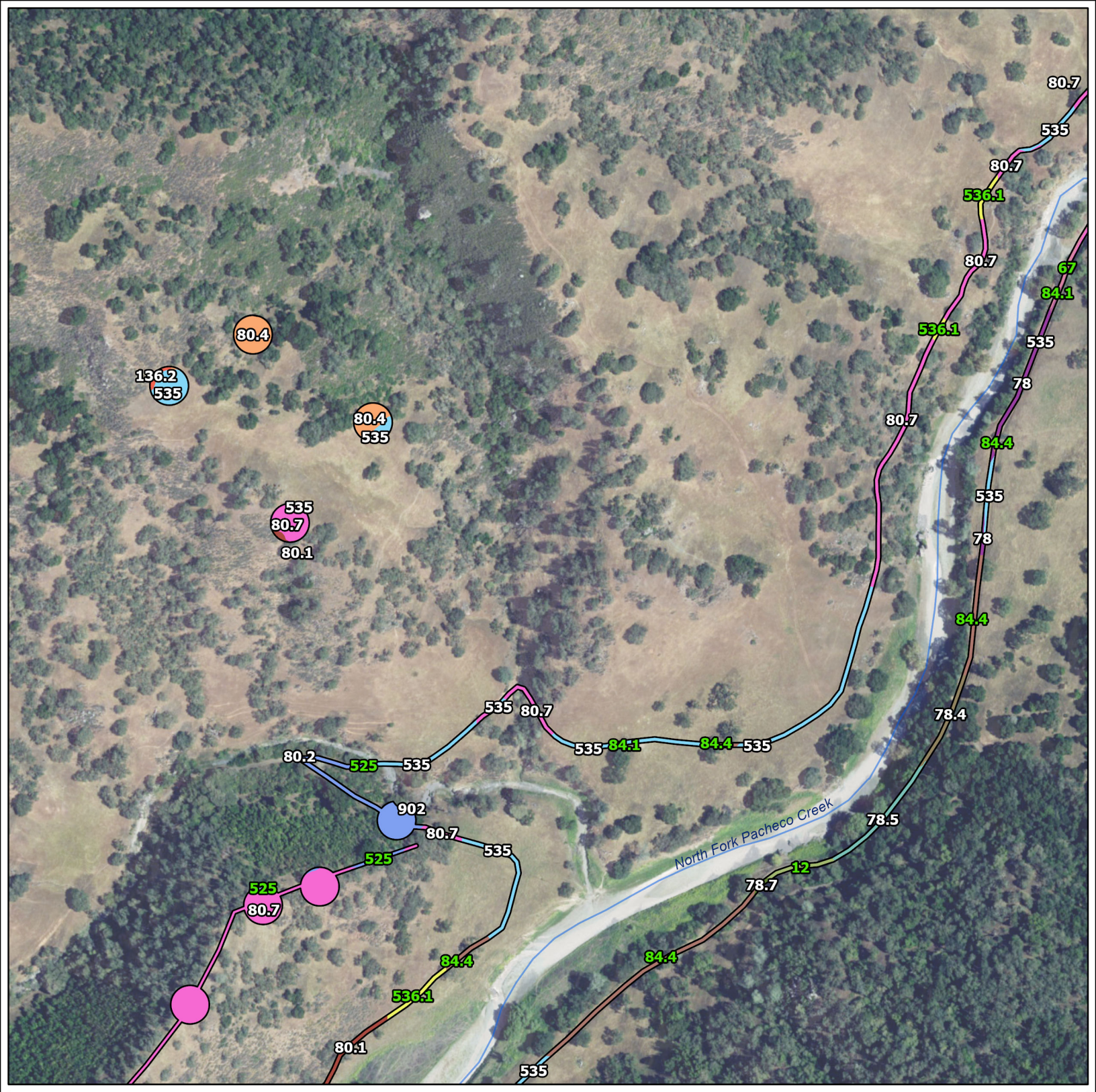

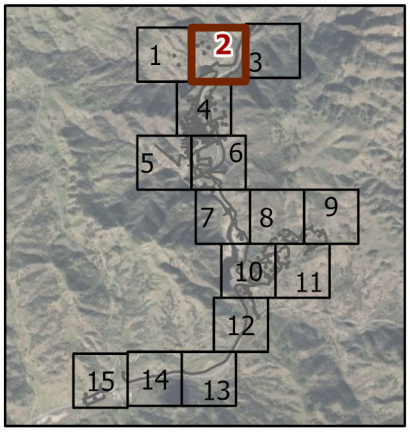

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

- Study Area
- Major Highway
- Stream/Creek

Vegetation Communities (Sensitive)

- 12—Aesculus californica
- 525—Prunus ilicifolia ssp. ilicifolia
- 536.1—Nassella pulchra – Avena spp. – Bromus spp.
- 67—Platanus racemosa
- 84.1—Quercus lobata – Quercus agrifolia / grass
- 84.4—Quercus lobata / grass

Vegetation Communities

- 136.2—Artemisia californica
- 535—Avena spp. – Bromus spp.
- 78.4—Quercus agrifolia / grass
- 78.5—Quercus agrifolia / Toxicodendron diversilobum
- 78.7—Quercus agrifolia – Umbellularia californica / Toxicodendron diversilobum
- 78—Quercus agrifolia
- 80.1—Quercus douglasii / Artemisia californica
- 80.2—Quercus douglasii – Aesculus californica / grass
- 80.4—Quercus douglasii – Quercus agrifolia
- 80.7—Quercus douglasii / Mixed herbaceous
- 902—Water (Reservoir)

Labels with green coloration rather than white are sensitive communities.

N

0 150 300 Feet

Projection: CA State Plane III NAD83
Prepared: SCP 2024-05-15

Valley Water

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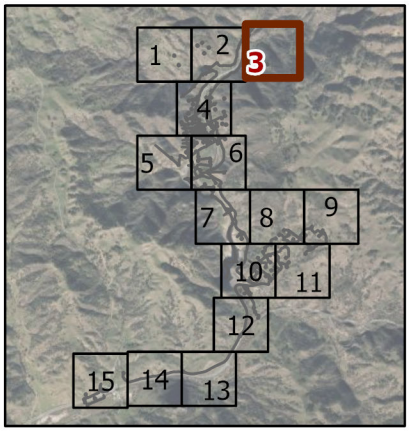

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

- Study Area
- Major Highway
- Stream/Creek

Vegetation Communities (Sensitive)

- 536.1—Nassella pulchra – Avena spp. – Bromus spp.

- 67.1—Platanus racemosa – Quercus agrifolia
- 67—Platanus racemosa
- 84.1—Quercus lobata – Quercus agrifolia / grass
- 84.4—Quercus lobata / grass

Vegetation Communities

- 535—Avena spp. – Bromus spp.
- 78—Quercus agrifolia
- 80.7—Quercus douglasii / Mixed herbaceous
- 902—Water (Reservoir)

**Labels with green coloration rather than white are sensitive communities.*

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Projection: CA State Plane III NAD83
Prepared: SCP 2024-05-15

Valley Water

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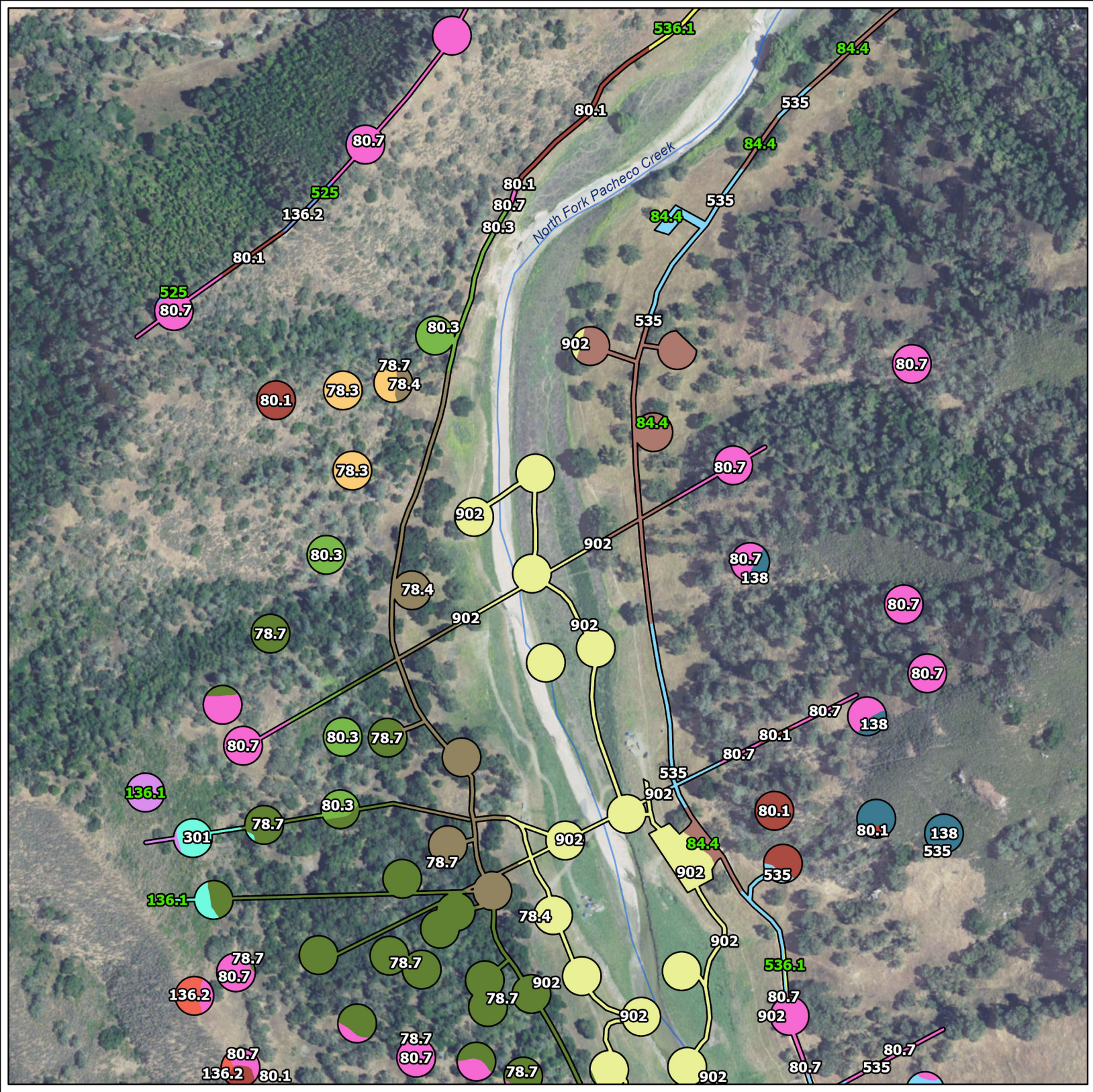

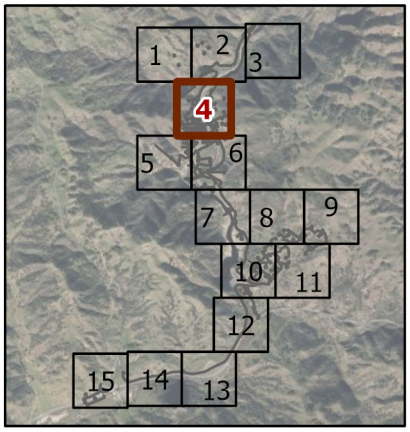

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

- Study Area
- Major Highway
- Stream/Creek

Vegetation Communities (Sensitive)

- 136.1—Artemisia californica – Diplacus aurantiacus
- 525—Prunus ilicifolia ssp. ilicifolia
- 536.1—Nassella pulchra – Avena spp. – Bromus spp.
- 84.4—Quercus lobata / grass

Vegetation Communities

- 136.2—Artemisia californica
- 138—Artemisia californica – Salvia mellifera
- 301—Toxicodendron diversilobum
- 535—Avena spp. – Bromus spp.
- 78.3—Quercus agrifolia / Artemisia californica
- 78.4—Quercus agrifolia / grass
- 78.7—Quercus agrifolia – Umbellularia californica / Toxicodendron diversilobum
- 80.1—Quercus douglasii / Artemisia californica
- 80.3—Quercus douglasii – Pinus sabiniana
- 80.7—Quercus douglasii / Mixed herbaceous
- 902—Water (Reservoir)

Labels with green coloration rather than white are sensitive communities.

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Projection: CA State Plane III NAD83
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Valley Water

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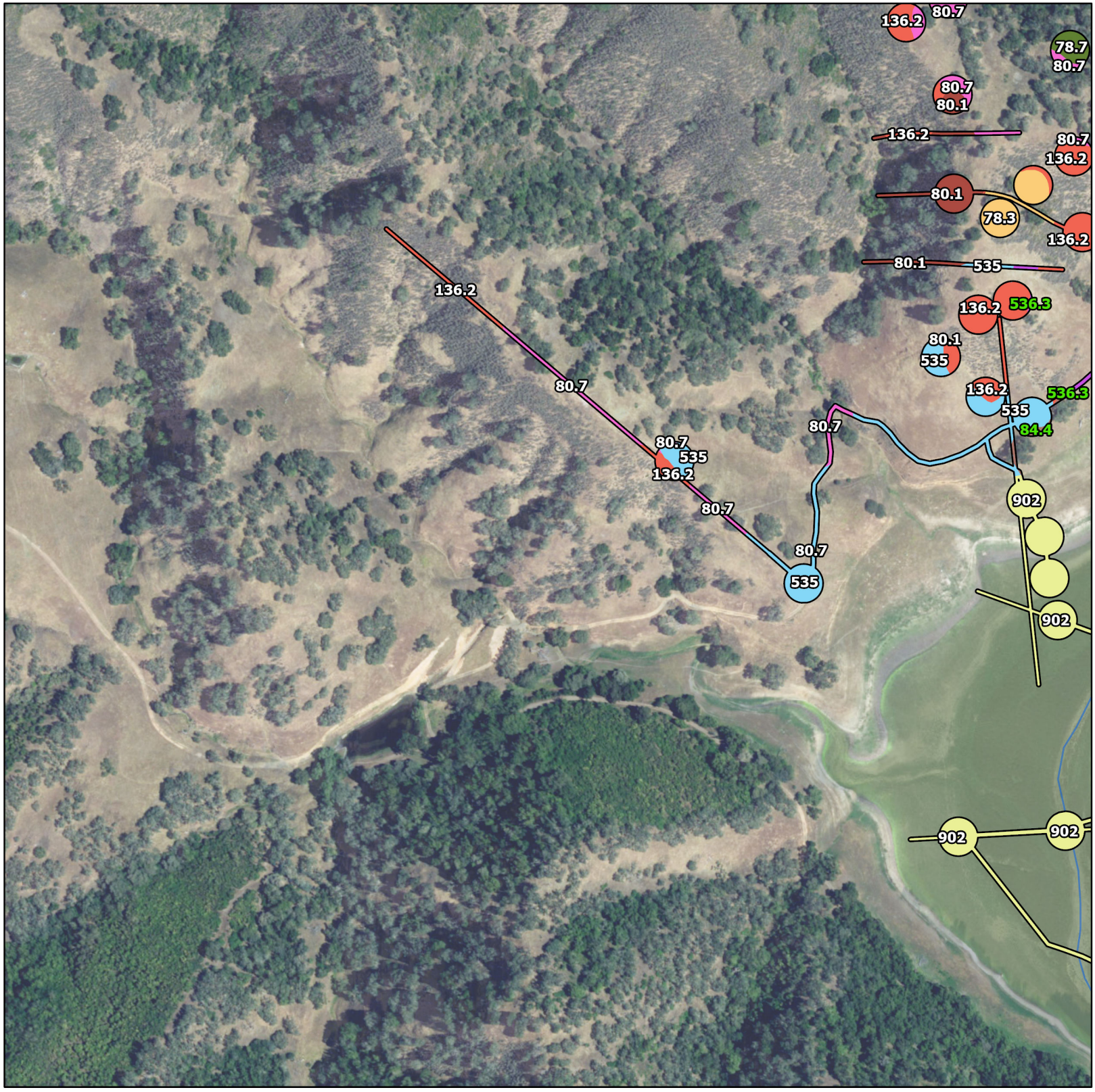

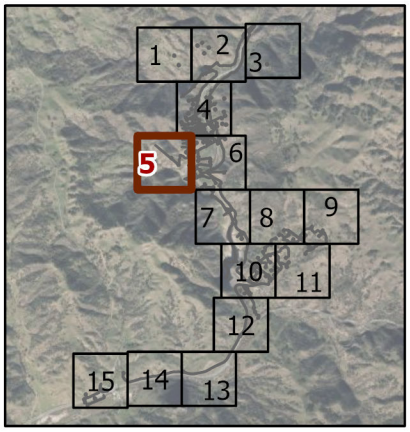

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

- Study Area
- Major Highway
- Stream/Creek

Vegetation Communities (Sensitive)

- 536.3—Nassella pulchra - Melica californica - annual grass

Vegetation Communities

- 136.2—Artemisia californica
- 535—Avena spp. – Bromus spp.
- 78.3—Quercus agrifolia / Artemisia californica
- 84.4—Quercus lobata / grass
- 78.7—Quercus agrifolia – Umbellularia californica / Toxicodendron diversilobum
- 80.1—Quercus douglasii / Artemisia californica
- 80.7—Quercus douglasii / Mixed herbaceous
- 902—Water (Reservoir)

**Labels with green coloration rather than white are sensitive communities.*

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Projection: CA State Plane III NAD83
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Valley Water

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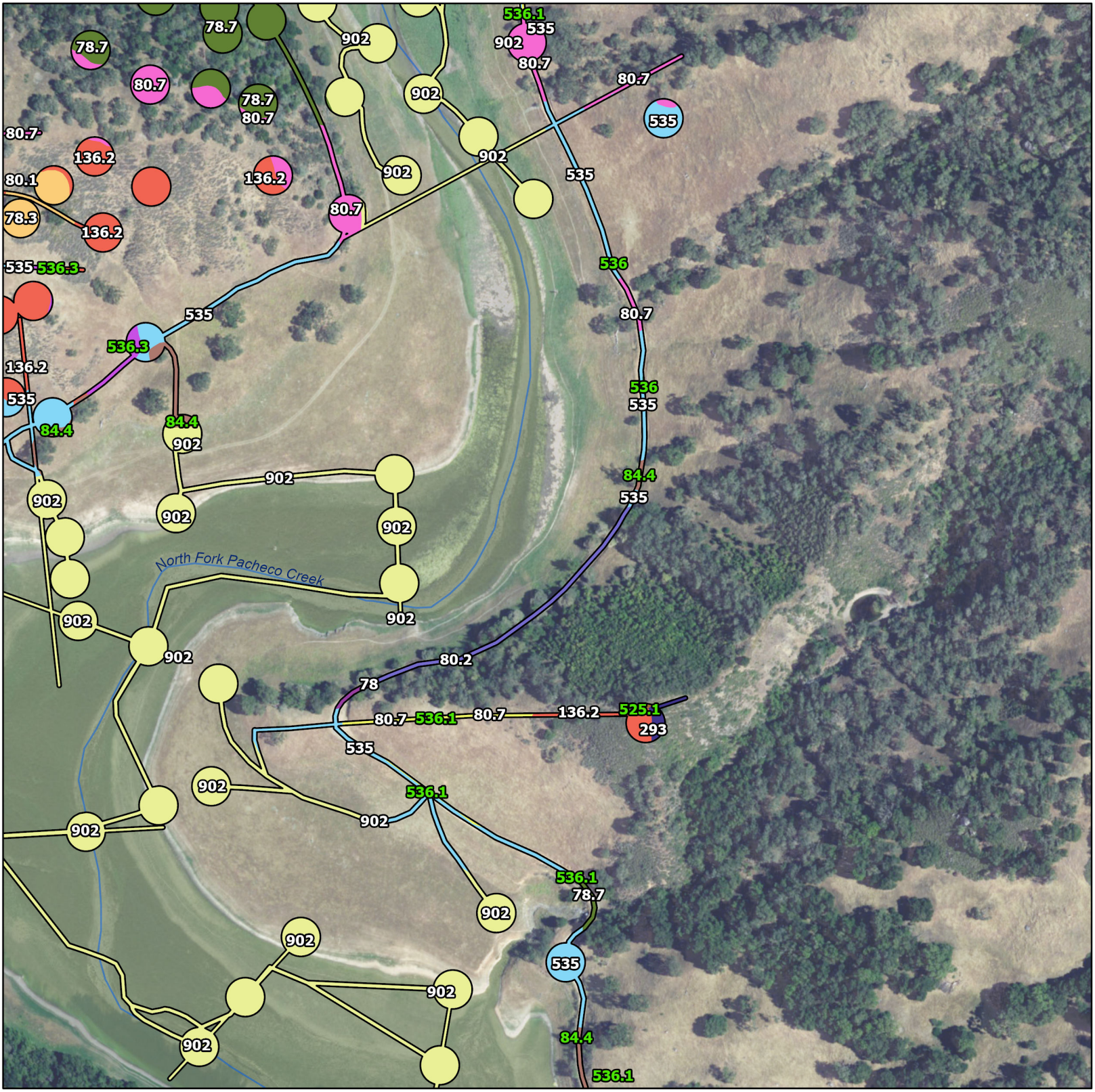
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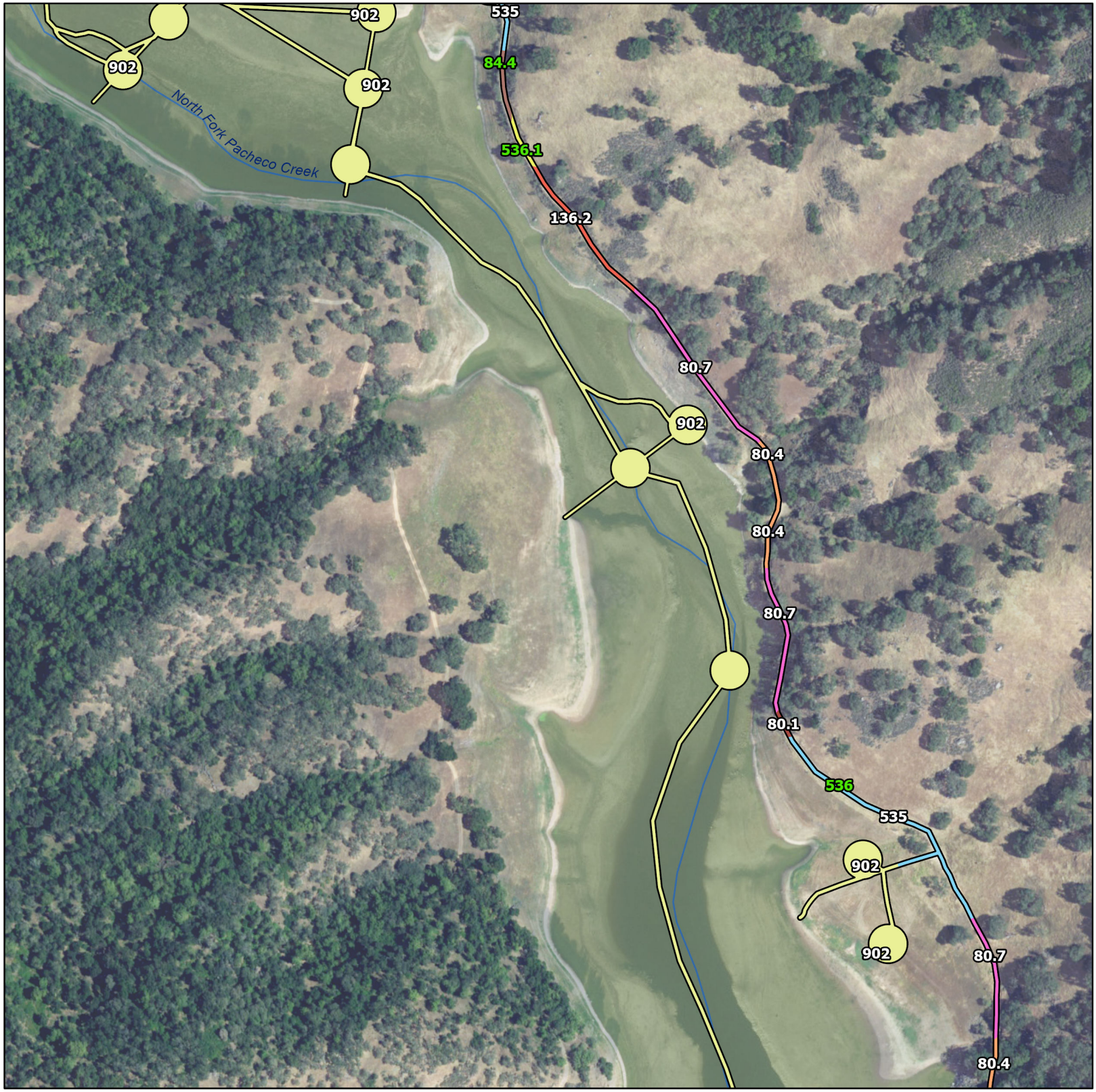

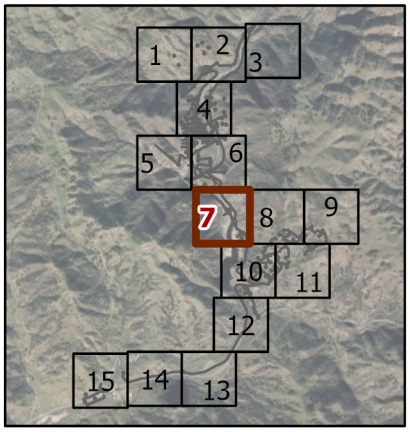

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

- Study Area
- Major Highway
- Stream/Creek

Vegetation Communities (Sensitive)

- 536.1—Nassella pulchra – Avena spp. – Bromus spp.

- 536—Needle grass - melic grass grassland
- 84.4—Quercus lobata / grass

Vegetation Communities

- 136.2—Artemisia californica
- 535—Avena spp. – Bromus spp.
- 80.1—Quercus douglasii / Artemisia californica
- 80.4—Quercus douglasii – Quercus agrifolia
- 80.7—Quercus douglasii / Mixed herbaceous
- 902—Water (Reservoir)

Labels with green coloration rather than white are sensitive communities.

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Projection: CA State Plane III NAD83
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Valley Water

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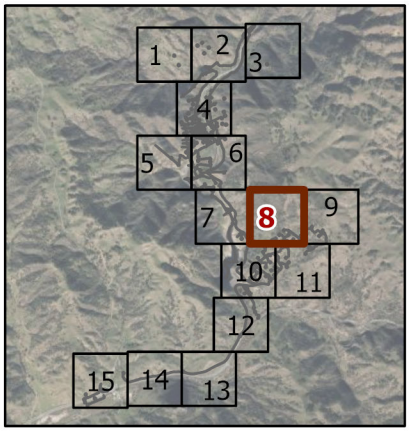

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

Study Area

Major Highway

Vegetation Communities (Sensitive)

536.1—Nassella pulchra – Avena spp. – Bromus spp.

78.2—Quercus agrifolia / Adenostoma fasciculatum – (Salvia mellifera)

84.1—Quercus lobata – Quercus agrifolia / grass

Vegetation Communities

535—Avena spp. – Bromus spp.

78.4—Quercus agrifolia / grass

78—Quercus agrifolia

80.4—Quercus douglasii – Quercus agrifolia

80.7—Quercus douglasii / Mixed herbaceous

**Labels with green coloration rather than white are sensitive communities.*

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Projection: CA State Plane III NAD83
Prepared: SCP 2024-05-15

Valley Water

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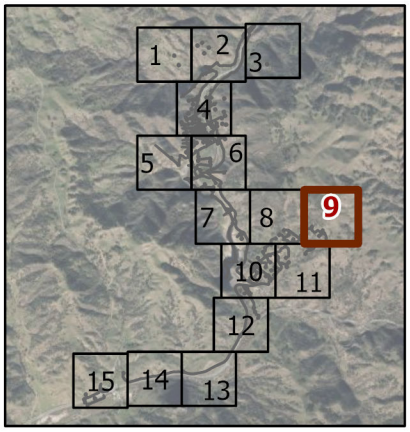

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

Study Area

Major Highway

Vegetation Communities (Sensitive)

536.1—Nassella pulchra – Avena spp. – Bromus spp.

78.2—Quercus agrifolia / Adenostoma fasciculatum – (Salvia mellifera)

Vegetation Communities

293—Salvia mellifera

535—Avena spp. – Bromus spp.

78.4—Quercus agrifolia / grass

**Labels with green coloration rather than white are sensitive communities.*

N

0 150 300 Feet

Projection: CA State Plane III NAD83
Prepared: SCP 2024-05-15

Valley Water

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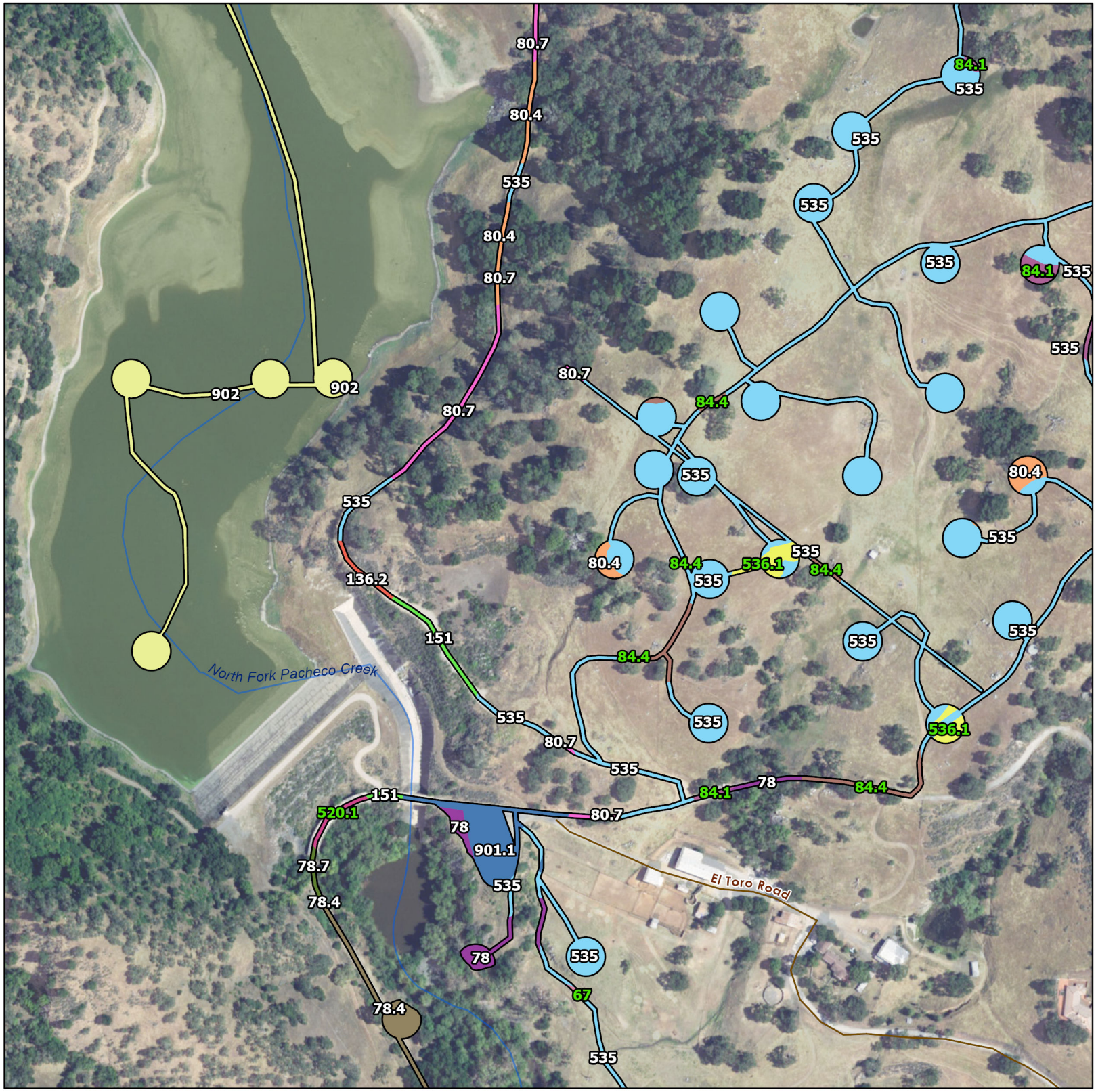

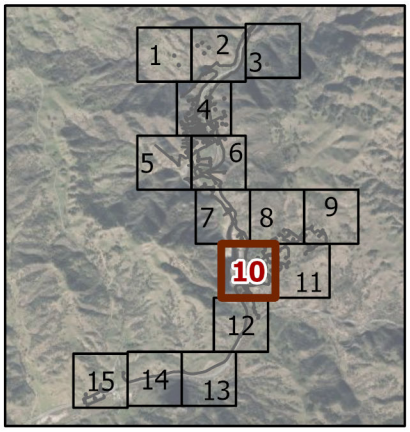

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

- Study Area
- Roads
- Major Highway
- Stream/Creek

Vegetation Communities (Sensitive)

- 520.1—Salix laevigata / Salix lasiolepis

- 536.1—Nassella pulchra – Avena spp. – Bromus spp.
- 67—Platanus racemosa
- 84.1—Quercus lobata – Quercus agrifolia / grass
- 84.4—Quercus lobata / grass

Vegetation Communities

- 136.2—Artemisia californica
- 151—Baccharis pilularis – Artemisia californica
- 535—Avena spp. – Bromus spp.
- 78.4—Quercus agrifolia / grass
- 78.7—Quercus agrifolia – Umbellularia californica / Toxicodendron diversilobum
- 78—Quercus agrifolia
- 80.4—Quercus douglasii – Quercus agrifolia
- 80.7—Quercus douglasii / Mixed herbaceous
- 901.1—Urban (Rural residential)
- 902—Water (Reservoir)

Labels with green coloration rather than white are sensitive communities.

N

0 150 300 Feet

Projection: CA State Plane III NAD83
Prepared: SCP 2024-05-15

Valley Water

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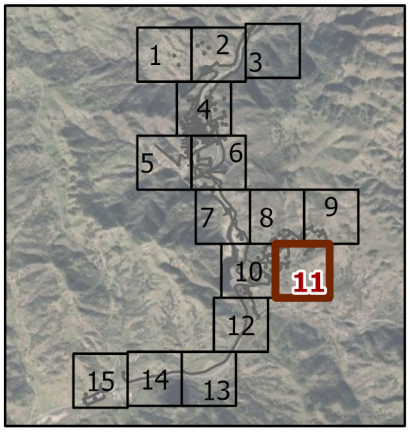

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

- Study Area
- Roads
- Major Highway

Vegetation Communities (Sensitive)

- 536.1—Nassella pulchra – Avena spp. – Bromus spp.

Vegetation Communities

- 78.2—Quercus agrifolia / Adenostoma fasciculatum – (Salvia mellifera)
- 84.1—Quercus lobata – Quercus agrifolia / grass
- 84.4—Quercus lobata / grass
- 293—Salvia mellifera
- 535—Avena spp. – Bromus spp.
- 78.4—Quercus agrifolia / grass
- 80.4—Quercus douglasii – Quercus agrifolia

**Labels with green coloration rather than white are sensitive communities.*

N

0 150 300 Feet

Projection: CA State Plane III NAD83
Prepared: SCP 2024-05-15

Valley Water

AECOM
Stantec GEI

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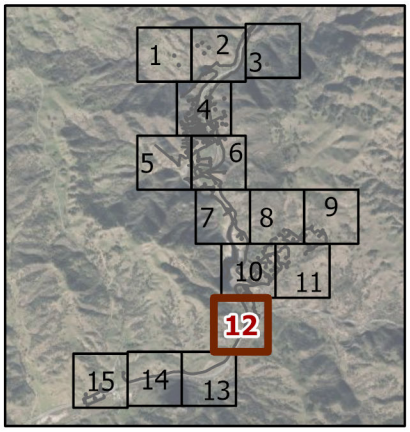

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

- Study Area
- Roads
- Major Highway
- Stream/Creek

Vegetation Communities (Sensitive)

- 520.1—Salix laevigata / Salix lasiolepis

- 67—Platanus racemosa
- 84.4—Quercus lobata / grass

Vegetation Communities

- 203—Eriogonum fasciculatum
- 535—Avena spp. – Bromus spp.
- 78.4—Quercus agrifolia / grass
- 78—Quercus agrifolia
- 80.7—Quercus douglasii / Mixed herbaceous
- 901—Urban (Barren)

**Labels with green coloration rather than white are sensitive communities.*

N

0 150 300 Feet

Projection: CA State Plane III NAD83
Prepared: SCP 2024-05-15

Valley Water

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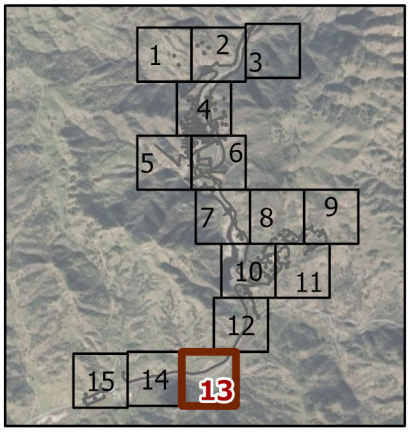

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

Study Area

Major Highway

Stream/Creek

Vegetation Communities (Sensitive)

536.1—Nassella pulchra – Avena spp. – Bromus spp.

Vegetation Communities

203—Eriogonum fasciculatum

535.1—Avena barbata

535—Avena spp. – Bromus spp.

**Labels with green coloration rather than white are sensitive communities.*

N

0 150 300 Feet

Projection: CA State Plane III NAD83
Prepared: SCP 2024-05-15

Valley Water

AECOM

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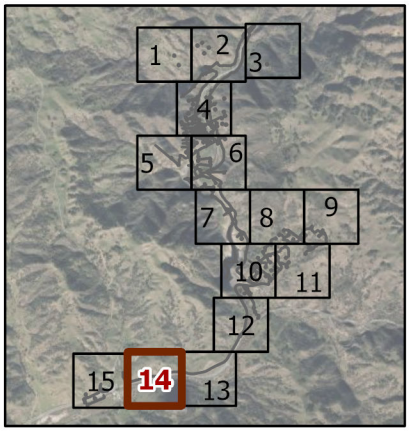

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

Study Area

Major Highway

Stream/Creek

Vegetation Communities

203—Eriogonum fasciculatum

535.1—Avena barbata

**Labels with green coloration rather than white are sensitive communities.*

N

0 150 300 Feet

Projection: CA State Plane III NAD83
Prepared: SCP 2024-05-15

Valley Water

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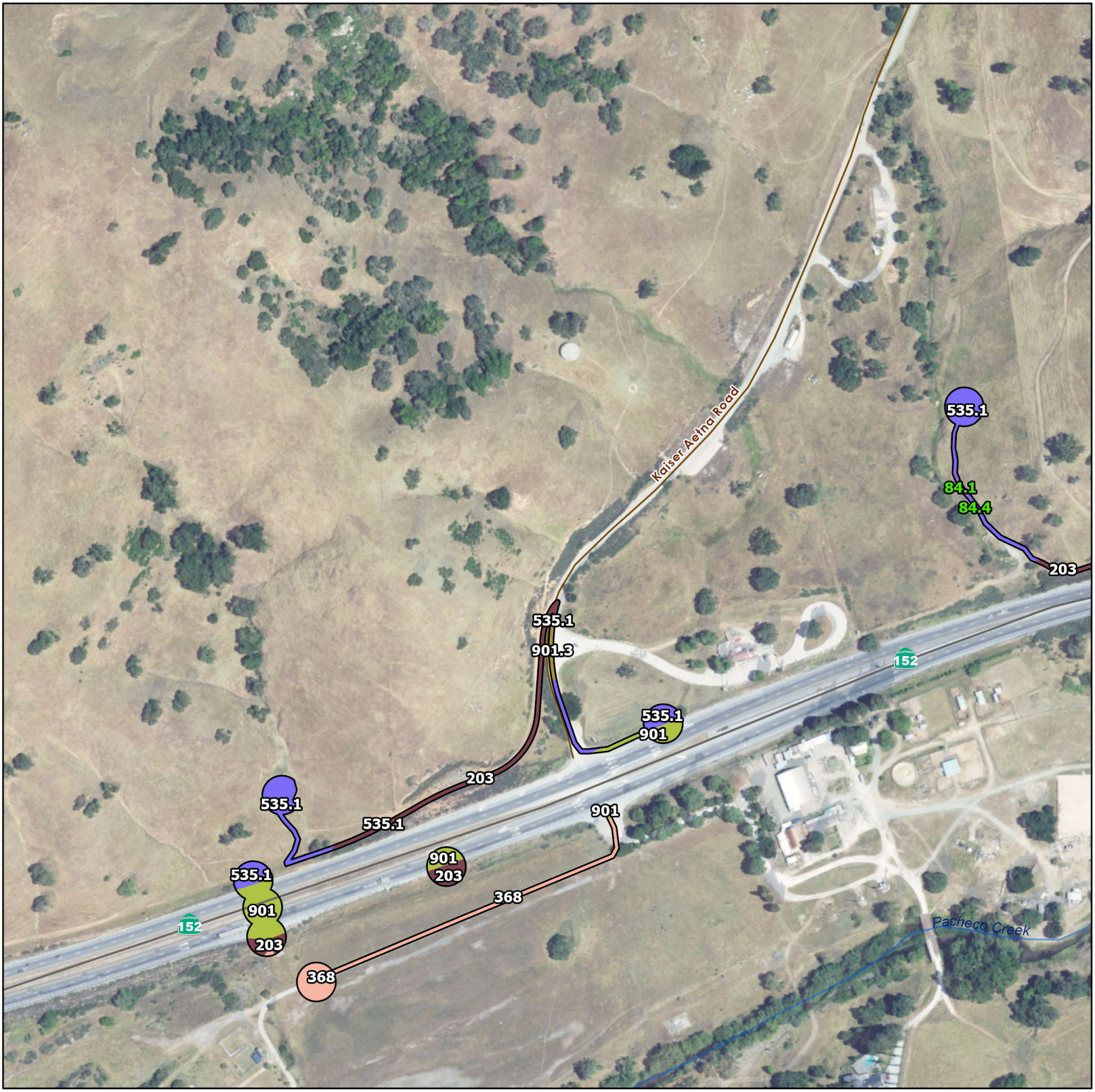

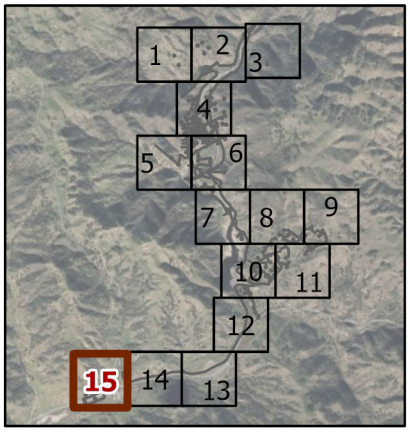

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

- Study Area
- Roads
- Major Highway
- Stream/Creek

Vegetation Communities (Sensitive)

- 84.1—Quercus lobata – Quercus agrifolia / grass
- 84.4—Quercus lobata / grass

Vegetation Communities

- 203—Eriogonum fasciculatum
- 368—Centaurea solstitialis
- 535.1—Avena barbata
- 901.3—Urban (Urban-Suburban)
- 901—Urban (Barren)

**Labels with green coloration rather than white are sensitive communities.*

N

0 150 300 Feet

Projection: CA State Plane III NAD83
Prepared: SCP 2024-05-15

Valley Water

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Stantec GEI

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Appendix D: Biological Resources

Pacheco Reservoir Expansion Project Design Level Geotechnical Investigations

Attachment 2 - Terrestrial Habitat Mapping

Exhibit 2B. Vegetation Alliances and Associations and Other Land Cover Types in the Project Study Area by Project Component

Alliance[1]	Association[1]	Sensitive Natural Community	Santa Clara Valley Habitat Plan Land Cover Type	Map ID	Area (Acres)
Access Routes					
California sycamore woodlands	*Platanus racemosa*	Yes	Central California sycamore alluvial woodland and mixed riparian forest and woodland	67	0.014
Coast live oak woodland	*Quercus agrifolia* / *Adenostoma fasciculatum* – (*Salvia mellifera*)	Yes	Coast live oak forest and woodland	78.2	0.000
	Quercus agrifolia / grass	No	Coast live oak forest and woodland	78.4	0.255
	Quercus agrifolia – Umbellularia californica / *Toxicodendron diversilobum*	No	Coast live oak forest and woodland	78.7	0.009
	Quercus agrifolia	No	Coast live oak forest and woodland	78	0.103
Blue oak woodland	*Quercus douglasii – Quercus agrifolia*	No	Blue oak woodland	80.4	0.107
Valley oak woodland	*Quercus lobata – Quercus agrifolia* / grass	Yes	Valley oak woodland	84.1	0.008
	Quercus lobata / grass	Yes	Valley oak woodland	84.4	0.172
Black sage scrub	*Salvia mellifera*	No	Northern coastal scrub/Diablan sage scrub	293	0.234
Wild oats and annual brome grasslands	*Avena barbata*	No	California annual grassland	535.1	0.039
	Avena spp. – *Bromus* spp.	No	California annual grassland	535	2.039
Needle grass – melic grass grassland	*Nassella pulchra – Avena* spp. – *Bromus* spp.	Yes	Non-serpentine native grassland	536.1	0.129
Urban	Urban (Rural residential)	No	Rural residential	901.1	0.024
Non-vegetated areas	Water (Reservoir)	No	Reservoir	902	3.360
				Subtotal	***6.494***
Access Route - Barge					
Non-vegetated areas	Water (Reservoir)	No	Reservoir	902	0.055
				Subtotal	***0.055***
Borings					
Coast live oak woodland	*Quercus agrifolia / Artemisia californica*	No	Coast live oak forest and woodland	78.3	0.785
	Quercus agrifolia / grass	No	Coast live oak forest and woodland	78.4	0.780

Alliance[1]	Association[1]	Sensitive Natural Community	Santa Clara Valley Habitat Plan Land Cover Type	Map ID	Area (Acres)
	Quercus agrifolia – Umbellularia californica / *Toxicodendron diversilobum*	No	Coast live oak forest and woodland	78.7	1.763
	Quercus agrifolia	No	Coast live oak forest and woodland	78	0.384
Blue oak woodland	*Quercus douglasii* / *Artemisia californica*	Not listed	Blue oak woodland	80.1	0.797
	Quercus douglasii – Pinus sabiniana	No	Blue oak woodland	80.3	0.361
	Quercus douglasii – Quercus agrifolia	No	Blue oak woodland	80.4	0.311
	Quercus douglasii / Mixed herbaceous	No	Blue oak woodland	80.7	2.447
Valley oak woodland	*Quercus lobata* / grass	Yes	Valley oak woodland	84.4	0.291
California sagebrush scrub	*Artemisia californica – Diplacus aurantiacus*	Yes	Northern coastal scrub/Diablan sage scrub	136.1	0.193
	Artemisia californica	No	Northern coastal scrub/Diablan sage scrub	136.2	0.881
California sagebrush – black sage scrub	*Artemisia californica – Salvia mellifera*	No	Northern coastal scrub/Diablan sage scrub	138	0.448
California buckwheat	*Eriogonum fasciculatum*	No	Northern coastal scrub/Diablan sage scrub	203	0.294
Black sage scrub	*Salvia mellifera*	No	Northern coastal scrub/Diablan sage scrub	293	0.057
Poison oak scrub	*Toxicodendron diversilobum*	No	Northern mixed chaparral/chamise chaparral	301	0.250
Yellow star-thistle fields	*Centaurea solstitialis*	No	California annual grassland	368	0.186
Holly leaf cherry – toyon – greenbark ceanothus chaparral	*Prunus ilicifolia* ssp. *ilicifolia – Fraxinus dipetala*	Yes	Northern mixed chaparral/chamise chaparral	525.1	0.022
	Prunus ilicifolia ssp. *ilicifolia*	Yes	Northern mixed chaparral/chamise chaparral	525	0.020
Wild oats and annual brome grasslands	*Avena barbata*	No	California annual grassland	535	2.427
	Avena barbata – Bromus spp.	No	California annual grassland	535.1	0.596
Needle grass – melic grass grassland	*Nassella pulchra – Melica californica* - annual grass	Yes	Non-serpentine native grassland	536.3	0.059
Urban	Urban (Rural residential)	No	Barren	901	0.453
Non-vegetated areas	Water (Reservoir)	No	Reservoir	902	7.353
				Subtotal	***21.157***
Established/Existing Road[4]					

Alliance[1]	Association[1]	Sensitive Natural Community	Santa Clara Valley Habitat Plan Land Cover Type	Map ID	Area (Acres)
California buckeye groves	*Aesculus californica*	Yes	Mixed evergreen forest	12	0.049
California sycamore woodlands	*Platanus racemosa – Quercus agrifolia*	Yes	Central California sycamore alluvial woodland and mixed riparian forest and woodland	67.1	0.012
	Platanus racemosa	Yes	Central California sycamore alluvial woodland and mixed riparian forest and woodland	67	0.043
Coast live oak woodland	*Quercus agrifolia* / grass	No	Coast live oak forest and woodland	78.4	0.780
	Quercus agrifolia / *Toxicodendron diversilobum*	No	Coast live oak forest and woodland	78.5	0.094
	Quercus agrifolia – Umbellularia californica / *Toxicodendron diversilobum*	No	Coast live oak forest and woodland	78.7	0.220
	Quercus agrifolia	No	Coast live oak forest and woodland	78	0.205
Blue oak woodland	*Quercus douglasii* / *Artemisia californica*	Not listed	Blue oak woodland	80.1	0.162
	Quercus douglasii – Aesculus californica / grass	No	Blue oak woodland	80.2	0.224
	Quercus douglasii – Pinus sabiniana	No	Blue oak woodland	80.3	0.123
	Quercus douglasii – Quercus agrifolia	No	Blue oak woodland	80.4	0.239
	Quercus douglasii / Mixed herbaceous	No	Blue oak woodland	80.7	1.317
Valley oak woodland	*Quercus lobata – Quercus agrifolia* / grass	Yes	Valley oak woodland	84.1	0.179
	Quercus lobata / grass	Yes	Valley oak woodland	84.4	1.115
California sagebrush scrub	*Artemisia californica*	No	Northern coastal scrub/Diablan sage scrub	136.2	0.174
Coyote brush scrub	*Baccharis pilularis – Artemisia californica*	No	Northern coastal scrub/Diablan sage scrub	151	0.119
California buckwheat	*Eriogonum fasciculatum*	No	Northern coastal scrub/Diablan sage scrub	203	1.333
Yellow star-thistle fields	*Centaurea solstitialis*	No	California annual grassland	368	0.241
Goodding's willow – red willow riparian woodlands	*Salix laevigata* / *Salix lasiolepis*	Yes	Willow riparian forest and scrub	520.1	0.057

Alliance[1]	Association[1]	Sensitive Natural Community	Santa Clara Valley Habitat Plan Land Cover Type	Map ID	Area (Acres)
Holly leaf cherry – toyon – greenbark ceanothus chaparral	*Prunus ilicifolia* ssp. *ilicifolia*	Yes	Northern mixed chaparral/chamise chaparral	525	0.128
Wild oats and annual brome grasslands	*Avena barbata*	No	California annual grassland	535.1	0.220
	Avena spp. – *Bromus* spp.	No	California annual grassland	535	4.487
Needle grass – melic grass grassland	*Nassella pulchra – Avena* spp. – *Bromus* spp.	Yes	Non-serpentine native grassland	536.1	0.354
	Nassella pulchra – Melica californica - annual grass	Yes	Non-serpentine native grassland	536.3	0.041
	No Association	Yes	Non-serpentine native grassland	536	0.007
Urban	Urban (Rural residential)	No	Rural residential	901.1	0.144
	Urban (Urban-Suburban)	No	Urban-suburban	901.3	0.042
	Urban (Barren)	No	Barren	901	0.052
Non-vegetated areas	Water (Reservoir)	No	Reservoir	902	0.024
				Subtotal	***12.188***
Helicopter Staging Area					
Valley oak woodland	*Quercus lobata* / grass	Yes	Valley oak woodland	84.4	0.002
Wild oats and annual brome grasslands	*Avena* spp. – *Bromus* spp.	No	California annual grassland	535	0.092
				Subtotal	***0.094***
Storage/Staging Area					
Coast live oak woodland	*Quercus agrifolia*	No	Coast live oak forest and woodland	78	0.082
Valley oak woodland	*Quercus lobata*	Yes	Valley oak woodland	84.4	0.049
Wild oats and annual brome grasslands	*Avena* spp. – *Bromus* spp.	No	California annual grassland	535	0.003
Urban	Urban (Rural residential)	No	Rural residential	901.1	0.463
Non-vegetated areas	Water (Reservoir)	No	Reservoir	902	0.279
				Subtotal	***0.877***
Refraction Line					
Coast live oak woodland	*Quercus agrifolia* / *Adenostoma fasciculatum* – (*Salvia mellifera*)	Yes	Coast live oak forest and woodland	78.2	0.057

Alliance[1]	Association[1]	Sensitive Natural Community	Santa Clara Valley Habitat Plan Land Cover Type	Map ID	Area (Acres)
	Quercus agrifolia / *Artemisia californica*	No	Coast live oak forest and woodland	78.3	0.045
	Quercus agrifolia / grass	No	Coast live oak forest and woodland	78.4	0.095
	Quercus agrifolia – Umbellularia californica / *Toxicodendron diversilobum*	No	Coast live oak forest and woodland	78.7	0.194
Blue oak woodland	*Quercus douglasii* / *Artemisia californica*	Not listed	Blue oak woodland	80.1	0.179
	Quercus douglasii – Pinus sabiniana	No	Blue oak woodland	80.3	0.039
	Quercus douglasii / Mixed herbaceous	No	Blue oak woodland	80.7	0.531
Valley oak woodland	*Quercus lobata – Quercus agrifolia* / grass	Yes	Valley oak woodland	84.1	0.047
	Quercus lobata / grass	Yes	Valley oak woodland	84.4	0.080
California sagebrush scrub	*Artemisia californica – Diplacus aurantiacus*	Yes	Northern coastal scrub/Diablan sage scrub	136.1	0.025
	Artemisia californica	No	Northern coastal scrub/Diablan sage scrub	136.2	0.262
Black sage scrub	*Salvia mellifera*	No	Northern coastal scrub/Diablan sage scrub	293	0.028
Poison oak scrub	*Toxicodendron diversilobum*	No	Northern mixed chaparral/chamise chaparral	301	0.031
Holly leaf cherry – toyon – greenbark ceanothus chaparral	*Prunus ilicifolia* ssp. *ilicifolia – Fraxinus dipetala*	Yes	Northern mixed chaparral/chamise chaparral	525.1	<0.001
	Prunus ilicifolia ssp. *ilicifolia*	Yes	Northern mixed chaparral/chamise chaparral	525	0.067
Wild oats and annual brome grasslands	*Avena* spp. – *Bromus* spp.	No	California annual grassland	535	0.535
Needle grass – melic grass grassland	*Nassella pulchra – Avena* spp. – *Bromus* spp.	Yes	Non-serpentine native grassland	536.1	0.137
	Nassella pulchra - Melica californica - annual grass	Yes	Non-serpentine native grassland	536.3	0.014
Non-vegetated areas	Water (Reservoir)	No	Reservoir	902	0.550
				Subtotal	***2.915***

Alliance[1]	Association[1]	Sensitive Natural Community	Santa Clara Valley Habitat Plan Land Cover Type	Map ID	Area (Acres)
Resistivity Line					
Coast live oak woodland	*Quercus agrifolia* / grass	No	Coast live oak forest and woodland	78.4	0.018
	Quercus agrifolia – Umbellularia californica / *Toxicodendron diversilobum*	No	Coast live oak forest and woodland	78.7	0.070
Blue oak woodland	*Quercus douglasii* / *Artemisia californica*	Not listed	Blue oak woodland	80.1	0.021
	Quercus douglasii / Mixed herbaceous	No	Blue oak woodland	80.7	0.070
Wild oats and annual brome grasslands	*Avena* spp. – *Bromus* spp.	No	California annual grassland	535	0.037
Non-vegetated areas	Water (Reservoir)	No	Reservoir	902	0.043
				Subtotal	***0.259***
Supplemental Boring					
Coast live oak woodland	*Quercus agrifolia* / grass	No	Coast live oak forest and woodland	78.4	0.183
	Quercus agrifolia – Umbellularia californica / *Toxicodendron diversilobum*	No	Coast live oak forest and woodland	78.7	0.918
Blue oak woodland	*Quercus douglasii – Pinus sabiniana*	No	Blue oak woodland	80.3	0.306
	Quercus douglasii / Mixed herbaceous	No	Blue oak woodland	80.7	0.966
Valley oak woodland	*Quercus lobata* / grass	Yes	Valley oak woodland	84.4	0.308
California sagebrush scrub	*Artemisia californica*	No	Northern coastal scrub/Diablan sage scrub	136.2	0.631
Holly leaf cherry – toyon – greenbark ceanothus chaparral	*Prunus ilicifolia* ssp. *ilicifolia*	Yes	Northern mixed chaparral/chamise chaparral	525	0.176
Wild oats and annual brome grasslands	*Avena* spp. – *Bromus* spp.	No	California annual grassland	535	0.737
Non-vegetated areas	Water (Reservoir)	No	Reservoir	902	1.119
				Subtotal	***5.344***

Alliance[1]	Association[1]	Sensitive Natural Community	Santa Clara Valley Habitat Plan Land Cover Type	Map ID	Area (Acres)
Test Pit					
Coast live oak woodland	*Quercus agrifolia* / grass	No	Coast live oak forest and woodland	78.4	0.468
	Quercus agrifolia	No	Coast live oak forest and woodland	78	0.184
Blue oak woodland	*Quercus douglasii – Quercus agrifolia*	No	Blue oak woodland	80.4	0.854
Valley oak woodland	*Quercus lobata – Quercus agrifolia* / grass	Yes	Valley oak woodland	84.1	0.153
	Quercus lobata / grass	Yes	Valley oak woodland	84.4	0.016
Black sage scrub	*Salvia mellifera*	No	Northern coastal scrub/Diablan sage scrub	293	0.214
Wild oats and annual brome grasslands	*Avena* spp. – *Bromus* spp.	No	California annual grassland	535	3.137
				Subtotal	***5.769***
				TOTAL	**55.153**

Notes:
[1] A Manual of California Vegetation, 2nd Edition (Sawyer et al. 2009).
[2] Not described in A Manual of California Vegetation or in Holland (1986). Insufficient data to determine sensitivity.
[3] Not described in A Manual of California Vegetation and dominated by non-native species, or agriculture, non-vegetated, or urban areas.
[4] Established/existing roads consist of either graveled or bare earth roads, and do not support vegetation.

Appendix D: Biological Resources

Pacheco Reservoir Expansion Project Design Level Geotechnical Investigations

Attachment 3 - Aquatic Resources Delineation

Describes potential waters of the U.S and waters of the state present within the upstream and downstream areas.

- Exhibit 3A. Wetland Determination Data Forms
- Exhibit 3B. Plant List
- Exhibit 3C. Soils Maps and Table
- Exhibit 3D. Waters of United States
- Exhibit 3E. Waters of State
- Exhibit 3F. Photos
- Exhibit 3G. Aquatic Resources Excel Spreadsheet



Attachment 3 - Aquatic Resource Delineation

Pacheco Reservoir Expansion Project Design Level Geotechnical Investigations

June 2024

Prepared by:

AECOM

Stantec GEI Consultants

Prepared for:

Valley Water

Valley Water Project Number: 91954002

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Exhibits

Exhibit 3A. Wetland Determination Data Forms

Exhibit 3B. Plant List

Exhibit 3C. Soils Table and Soils Map

Exhibit 3D. Delineation Map – Waters of the United States and State

Exhibit 3E. Delineation Map – Waters of the State

Exhibit 3F. Photos

Exhibit 3G. Aquatic Resources Excel Spreadsheet

Acronyms and Abbreviations

AF	acre-feet
CDFW	California Department of Fish and Wildlife
CVP	Central Valley Project
CWA	Clean Water Act
District	USACE Sacramento District
FAC	facultative
FACU	Facultative upland
FACW	facultative wetland
GPS	global positioning system
NI	No indicator
NL	Not listed
NRCS	Natural Resources Conservation Service’s
NWPR	Navigable Waters Protection Rule
OBL	obligate
OHWM	Ordinary High-Water Mark
PPWD	Pacheco Pass Water District
PREP	Pacheco Reservoir Expansion Project
Project	Design Level Geotechnical Investigations
SBCWD	San Benito County Water District
SCVHP	Santa Clara Valley Habitat Plan
SR 152	State Route 152
SWP	State Water Project
TNW	Traditional Navigable Water
UPL	upland
USACE	U. S. Army Corps of Engineers
USGS	U.S. Geological Survey

Executive Summary

Ascent Environmental conducted a delineation of aquatic resources within the portions of the 55-acre Project study area of the Design Level Geotechnical Investigations proposed in support of Valley Water's Pacheco Reservoir Expansion Project (PREP) planning process during May, August, September, October, and December 2019 and January, February, and March 2020. Stantec Consulting Services (Stantec) biologists conducted additional delineation fieldwork in August 2020. Ascent Environmental continued delineating the remainder of the Project study area in May of 2023 once landowner access was obtained. The U.S. Army Corps of Engineers (USACE) 1987 *Wetlands Delineation Manual* (Environmental Laboratory 1987) and *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Environmental Laboratory 2008) were used to delineate wetlands that are potentially subject to USACE jurisdiction under Section 404 of the Clean Water Act (CWA). The delineation was conducted in accordance with the 2008 *Field Guide to the Identification of the Ordinary High-Water Mark (OHWM) in the Arid West Region of the Western United States* (Lichvar and McColley 2008). This report conforms to the USACE San Francisco District's *Minimum Standards for Acceptance of Aquatic Resources Delineation Reports* (USACE 2016a) and *Updated Map and Drawing Standards for the Pacific Division Regulatory Program Delineations* (USACE 2016b).

Waters of the state are defined under the Porter-Cologne Water Quality Control Act and are further described for wetlands in the State Water Resources Control Board's (SWRCB) *Implementation Guidance for the State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State* (SWRCB 2020).

A total of approximately 12.858 acres of potentially jurisdictional waters of the State of California, including wetlands, are present within the 55-acre Project study area, consisting of 3.017 acres of wetlands and 9.841 acres of other waters (2,148 linear feet). A subset of these aquatic resources is considered waters of the United States, which total of 9.350 acres consisting of 6.498 acres of other waters and 2.852 acres of wetlands. Named aquatic resources in the Project study area include North Fork Pacheco Creek, South Fork Pacheco Creek, Pacheco Reservoir and Pacheco Creek. Multiple ephemeral and intermittent tributary streams flow into North Fork Pacheco Creek within the Project study area. Other waters of the state consist of 0.065 acre of intermittent streams, 0.118 acre of ephemeral streams, 6.467 acres of reservoir, and 3.191 acres of reservoir shorelines.

Chapter 1. Introduction

This attachment to the Biological Resources Appendix was prepared for the Design Level Geotechnical Investigations (Project) that are proposed in support of the Pacheco Reservoir Expansion Project (PREP). This attachment and supporting exhibits have been prepared to describe aquatic resources (i.e., non-fisheries) in the Project study area.

1.1 Background

The existing Pacheco Reservoir and North Fork Dam were constructed in 1939 by the Pacheco Pass Water District (PPWD) to provide irrigation and domestic water supply. These facilities are owned and operated by the PPWD. The existing reservoir has an operational capacity of 5,500 AF. Water released from the reservoir flows down Pacheco Creek and recharges the underlying groundwater aquifer. Agricultural water users in PPWD and San Benito County Water District (SBCWD) pump water from the aquifer.

PREP includes construction and operation of a new dam and reservoir, pump station, conveyance facilities, and related miscellaneous infrastructure (e.g., access roads). The new dam and reservoir would be constructed on Pacheco Creek upstream from the existing North Fork Dam and would inundate most of the existing Pacheco Reservoir. Water would be collected in the new reservoir during the winter months from runoff from the local watershed area, and diversion of Central Valley Project (CVP) supplies from San Luis Reservoir via Pacheco Conduit, as available.

The existing Pacheco Reservoir is located in unincorporated Santa Clara County, approximately 17 miles northeast of the City of Gilroy and 0.4 miles north of State Route 152 as shown in Figure 1-1. Pacheco Reservoir is situated on the North Fork of Pacheco Creek. The headwaters of Pacheco Creek are in the Diablo Range, northeast of the city of Hollister. Downstream of Pacheco Reservoir, Pacheco Creek continues to flow west until it reaches San Felipe Lake, draining approximately 168 square miles in Santa Clara and San Benito counties. San Felipe Lake is drained by Miller Canal, which joins the Pajaro River and flows southwest until it drains into Monterey Bay.

San Luis Reservoir is located 8 miles east of Pacheco Reservoir in unincorporated Merced County. The U.S Department of the Interior, Bureau of Reclamation owns and jointly operates San Luis Reservoir with the California Department of Water Resources to provide seasonal storage for the CVP and the State Water Project. Deliveries from San Luis Reservoir to CVP San Felipe Division of the CVP (i.e., deliveries to Valley Water and SBCWD) flow west through Pacheco Pumping Plant and Conduit.

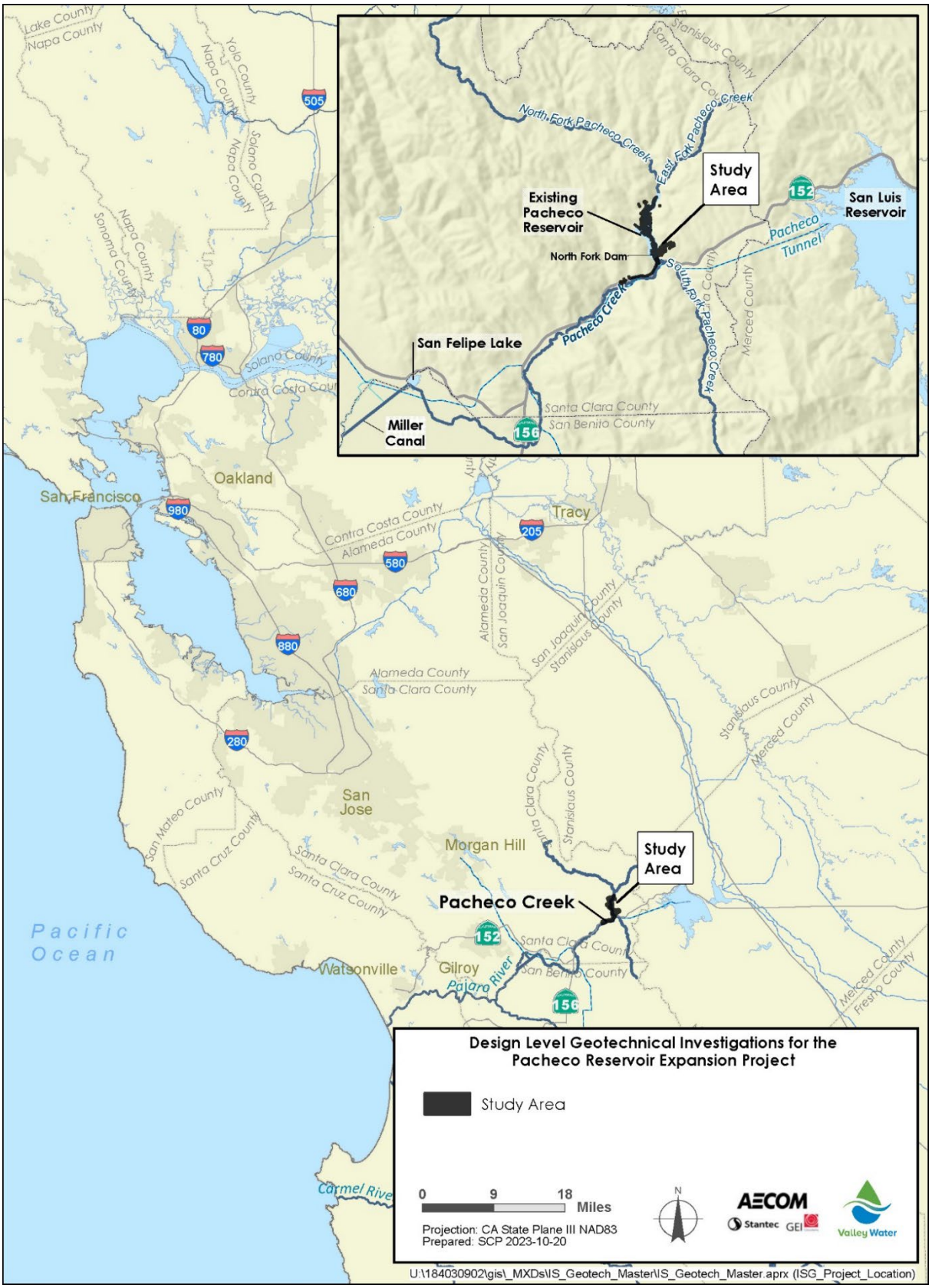


Figure 1-1. Project Location

Chapter 2. Study Area for Aquatic Resource Delineations

The Project study area for the aquatic resource delineation encompasses portions of Pacheco Reservoir and lands in and/or adjacent to Pacheo Creek, North Fork Pacheco Creek and South Fork Pacheco Creek where geotechnical investigations activities (Project) are proposed (Figure 2-1). The approximately 55-acre Project study area for the delineation is primarily within the existing Pacheco Reservoir and upstream areas (i.e., generally north of North Fork Dam) surrounding the reservoir, and also includes activity areas in the South Fork Pacheco Creek and Pacheco Creek watersheds in close proximity to SR 152 (Figure 2-1). The Project study area includes all currently proposed activity areas associated with the proposed Project (e.g., access routes, borings, test pits).

The Project study area can be accessed via SR 152. The proposed Project is located within Section 10 South and Range 6 East of the U.S. Geological Survey (USGS) 7.5-minute *Pacheco Peak, California* quadrangle (Figure 2-1).

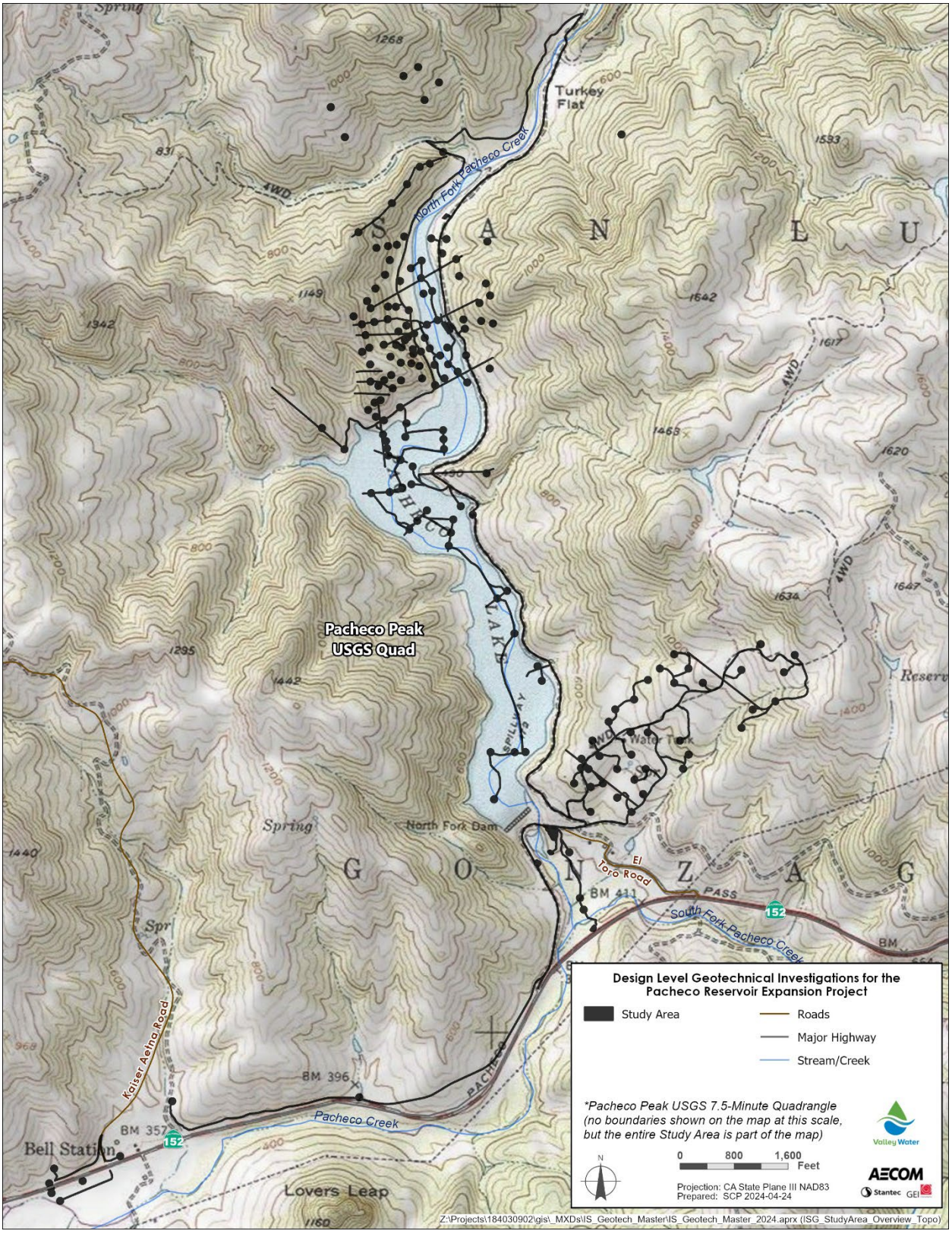


Figure 2-1. Aquatic Resource Delineation Project Study Area

Chapter 3. Current Regulations and Preliminary Jurisdictional Assessment

Agency jurisdiction for each of the delineated aquatic resources described in this attachment are based on the definitions and regulations described in the sections below. All jurisdictional assessments in this attachment should be considered preliminary until the USACE and SWRCB or Regional Water Quality Control Board (RWQCB) provide verification.

3.1 Waters of the United States

Waters of the United States as defined in the CWA Sections 404 and 401 consist of wetlands and "other waters" regulated by the USACE and, for California, the SWRCB and the RWQCBs. On September 8, 2023, the Environmental Protection Agency and the USACE issued a rule to conform to the regulatory definition of Waters of the United States as defined in the May 25, 2023 United States Supreme Court decision in *Sackett v. Environmental Protection Agency* (2023) 598 U.S. 651 (Sackett), which replaces all previous guidance regarding features considered waters of the United States, (i.e., wetlands and "other waters" subject to USACE jurisdiction under the CWA). The most notable changes or redefinitions described under the Sackett ruling from previous guidance documents is that ephemeral features (e.g., streams, ditches, swales) are no longer considered waters of the United States, and that the CWA only covers relatively permanent, standing, or continuously flowing bodies of waters that are typically referred to as streams, oceans, rivers, and lakes. In addition, under the Sackett ruling, to be considered a water of the United States, wetlands must have "a continuous surface connection to bodies that are considered waters of the United States (i.e., relatively permanent bodies of water connected to a Traditional Navigable Water) so that they are "indistinguishable" from those waters.

3.2 Waters of the State

Waters of the state are defined under the Porter-Cologne Water Quality Control Act and are further described for wetlands in the SWRCB's *Implementation Guidance for the State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State* (SWRCB 2020). The Porter-Cologne Water Quality Control Act defines wetlands and "other waters" as described below:

- **Wetlands**: Wetlands are considered waters of the state when features meet the 3-parameters/criteria used by the USACE (i.e., prevalence of hydrophytic vegetation, hydric soils, and hydrology). The state definition differs for wetlands in cases where features are naturally devoid of vegetation (i.e., features with less than 5 percent cover) where the hydric substrate indicators (i.e., hydric soils and hydrology) can act as a substitute for a dominance of hydrophytic vegetation. Under the state definition isolated wetlands are also considered waters of the state (i.e., non-adjacent features or those without continuous surface connections to waters of the United States are jurisdictional).

- **Other Waters**: All "other water" features must have an Ordinary High-Water Mark (OHWM); however, unlike the water of the United States, the state definition extends the jurisdiction to include ephemeral and isolated other water features as waters of the state.

Under the California Fish and Game Code, Sections 1600-1616, the California Department of Fish and Wildlife (CDFW) has the authority to issue lake or streambed alteration agreements for construction activities that substantially divert or obstruct the natural flow or substantially change

the bed, channel, or bank of any river, stream, or lake designated by the CDFW as providing resources for fish or wildlife.

Chapter 4. Methods

A delineation of aquatic resources within the Project study area was conducted using a combination of desktop review and interpretation of existing data and fieldwork conducted in 2019, 2020, and 2022 as part of the overall PREP survey efforts. Before conducting the field delineation of the Project study area, an Ascent wetland ecologist reviewed color aerial imagery of the study area on Google Earth, Light Detection and Ranging data, Valley Water's stream data (Valley Water 2018), National Wetlands Inventory data (USFWS 2023), and the Natural Resources Conservation Service's (NRCS) soil survey of Eastern Santa Clara Area, California (NRCS 1974) and the Soil Survey of San Benito County, California (NRCS 1969), to determine areas of potential USACE jurisdiction. The 2019 field delineation was conducted on September 10-12, 16-17, and 23-25; October 28-31; and December 2-6 and 9-12, 2019by Ascent wetland ecologists Tammie Beyerl, Shannon Hickey, and Pamela Brillante. In 2020, work was conducted on February 10-13 by Ascent wetland ecologists Tammie Beyerl, Shannon Hickey, and Pamela Brillante, and Stantec biologists Brendan Cohen and Meghan Oats conducted additional fieldwork on August 10-11. As of December 31, 2019, average precipitation in the area was 100 percent of normal for the water year (NOAA 2023a). As of March 31, 2020, average precipitation in the area was at 125 percent of normal for the water year (NOAA 2023b). Additional field delineation work was performed by Ascent wetland ecologists Tammie Beyerl, Shannon Hickey, Pamela Brillante, Taelor Whittington, and Karileigh Williams on November 14-16, 2022. As of December 2022, average precipitation in the area was at 150 percent of normal for the water year (NOAA 2023b). Potentially jurisdictional features were mapped, and jurisdictional determination and data forms were completed during the Project study area-specific survey dates.

The 55-acre Project study area is located within the overall PREP study area, which encompasses approximately (6,750 acres, including the 100-year floodplain of Pacheco Creek from downstream of the North Fork Dam to San Felipe Lake. The field delineation efforts for the PREP planning process to-date have focused on the entirety of the PREP study area; as such, many of the data points have been collected in areas outside the boundaries of the Project study area. While the data points are located outside of the Project study area, the features (i.e., wetlands/other waters) (e.g., vegetation, hydric soil indicators, hydrology, OHWM indicators) described in the data forms are characteristic of those found within the Project study area. Jurisdictional determination data forms were completed for 39 representative data points during the survey and are provided in Exhibit 3A to this attachment. Potential jurisdictional areas were identified and mapped during desktop analysis and then confirmed and refined in the field using ArcGIS Collector application and a global positioning system (GPS). Data point locations were also recorded digitally using a GPS data logger and imported onto an electronic version of the aerial photograph. GPS data were recorded in World Geodetic System (WGS) datum of 1984.

Waters of the United States and state were delineated based on the OHWM, using the USACE's *Guide to OHWM Delineation in the Arid West Region* (Lichvar and McColley 2008) and the USACE's Updated Datasheet for the Identification of the OHWM in the Arid West region (Curtis and Lichvar 2010).

To determine whether the location of a wetland data point was dominated by hydrophytic vegetation, plant species at each sample site were recorded and the wetland indicator status was recorded for the dominant species using USACE's National Wetlands Plant List for the Arid West Region (Lichvar et al. 2016). A species is considered dominant when that species—individually or collectively—accounts for 50 percent of the total absolute cover in a vegetation stratum. Additional

codominant species are identified if those species account for at least 20 percent of the absolute cover in a designated vegetation stratum (Environmental Laboratory 2008).

Hydrophytic species include those listed as obligate (OBL), facultative wetland (FACW), or facultative (FAC) species, which correspond to a given species' frequency of occurrence in wetlands. The plant indicator categories are defined as:

- OBL: Almost always (greater than 99 percent of the time) occur in wetlands,
- FACW: Usually (between 66 percent and 99 percent of the time) occur in wetlands, and
- FAC: Equally likely to occur in wetlands and non-wetlands (between 33 percent and 66 percent occurrence in wetlands).

Per delineation protocol, a sample site was considered to have hydrophytic vegetation if greater than 50 percent of the dominant species had an indicator status of FAC or wetter. The following indicators are used to identify species not considered hydrophytic:

- Facultative upland (FACU)— species that usually occur in non-wetlands (67 percent–99 percent estimated probability) but are occasionally found in wetlands (1 percent–33 percent estimated probability);
- Obligate upland (UPL)— species that may occur in wetlands in another region, but almost always (greater than 99 percent) occur in non-wetlands in California under natural conditions;
- No indicator (NI)—species for which insufficient information was available to determine an indicator status; and
- Not listed (NL)—species not listed in National Wetland Plant List (Lichvar et al. 2016).

Standard protocol states that a species with an NL designation should be considered UPL when the delineator completes the "Prevalence Index Worksheet" portion of the wetland delineation data form (Environmental Laboratory 2008). Botanical nomenclature follows *The Jepson Manual: Vascular Plants of California, Second Edition* (Baldwin et al. 2012). A list of all plant species observed in the overall PREP study area, which includes the Project study area, and their wetland indicator status is provided in Exhibit 3B.

The soil survey of Eastern Santa Clara Area, California (NRCS 1974) and the Soil Survey of San Benito County, California (NRCS 1969), were consulted to identify soil units mapped in the study area by NRCS and these soils were cross referenced to *The National Hydric Soils List* (NRCS 2023a) to determine if any of the mapped soil units are listed as hydric. Soils were examined by digging soil test pits to determine whether hydric soils exist in a sampling location. Soils were described in terms of depth, matrix color, moisture status, and other diagnostic features indicative of hydric soils, such as the presence of concretions and oxidized rhizospheres (a redoximorphic feature, according to Vepraskas [1994]). Hydric soil indicators were based on those provided in the 1987 USACE manual, 2010 regional supplement, *Field Indicators of Hydric Soils in the United States: A Guide for Identifying and Delineating Hydric Soils* (NRCS 2018), and Vepraskas (1994).

Wetland hydrology was assessed by recording observations such as inundation, high water table, algal crust, drift deposits, water marks, and oxidized rhizospheres along living root channels. In addition, the potentially jurisdictional areas were all evaluated in terms of their status as a navigable waterway or their adjacency or hydrological connection to a navigable waterway.

Chapter 5. Existing Conditions

5.1 Landscape Setting

The Project study area occurs within the Pacheco Pass portion of the Diablo Range east of the Santa Clara Valley. Elevations range from a high of nearly 1,000 feet above mean sea level in the upper portions of the Project study area to a low of approximately 350 feet above mean sea level. The Project study area is characterized by rugged topography with steep, mostly northeast-facing and southwest-facing slopes. The predominant land use in the Project study area is livestock grazing.

The climate of the Project study area is characterized by warm, dry summers, and moderate to cool, relatively dry winters. On average, temperatures are highest in July, reaching 92 degrees Fahrenheit, and lowest in January at about 38 degrees Fahrenheit. The Project study area experiences an average of 21 inches of rain per year.

The Project study area is within the Pajaro (HUC 18060002) USGS hydrologic unit code (HUC)-8 watershed subbasin. The major named waterways in the Project study area are Pacheco Creek and North Fork Pacheco Creek. Pacheco Creek originates upstream of the Project study area in the Diablo Range and drains approximately 168 square miles in Santa Clara and San Benito counties. Downstream of Pacheco Reservoir, Pacheco Creek flows westward to San Felipe Lake. San Felipe Lake is drained by Miller Canal, which joins the Pajaro River and flows southwest until it drains into Monterey Bay (Valley Water 2020). The Pajaro River is the nearest Traditional Navigable Water (TNW) that has surface hydrological connections to major waterways in the study area. TNWs are defined as all waters subject to the ebb and flow of the tide, or waters that are presently used, have been used in the past, or may be used in the future to transport interstate or foreign commerce, and all waters that are navigable in fact under federal law for any purpose.

The Project study area is in a tectonically active area associated with the San Andreas Fault system and geologic activity has greatly influenced local stream formation and watershed structure and function (Santa Clara County et al. 2010).

The Diablo Range consists of shallow bedrock and steep topography with some low-lying alluvium-filled valleys with gentle topographic relief (San Benito County 2015, Santa Clara County 1994). The Project study area is generally composed of gently rolling to steep hills that are covered by oak woodland interspersed with annual grassland and shrubland.

Table 1 in Exhibit 3C of this attachment provides a list of the soil map units in the Project study area, according to the Soil Survey of Eastern Santa Clara Area, California (NRCS 1974) and the Soil Survey of San Benito County, California (NRCS 1969), a brief description, and the hydric status of the soil map unit according to the National Hydric Soils List (NRCS 2023b). The locations of these soil units in the Project study area, as mapped by NRCS, are depicted on the soils maps in Exhibit 3C of this attachment.

Vegetation in the Project study area was mapped to the association level following the classification system described in *A Manual of California Vegetation, 2nd Edition* (MCV) (Sawyer et al. 2009) and updated in the current online edition (California Native Plant Society 2023) during ongoing biological studies being conducted as part of the PREP. As part of the vegetation mapping a crosswalk was developed between the MCV and the Santa Clara Valley Habitat Plan (SCVHP) land cover types (Santa Clara Valley Habitat Agency 2012). For the purposes of this

document, the more generic SCVHP landcover types are presented in Table 5-1, below as a summary of the terrestrial vegetation communities present in the Project study area. The predominant upland land cover types in the Project study area are blue oak woodland and California annual grassland. Table 5-1 lists the terrestrial land cover types, classified according to the classification system of the Santa Clara Valley Habitat Plan (SCVHP) (Santa Clara Valley Habitat Agency 2012), and provides a description of each type. A complete list of plant species observed in the overall PREP study area, which includes the Project study area, during field delineations and botanical surveys, and their indicator status is provided in Exhibit 3B of this attachment.

Table 5-1 Santa Clara Valley Habitat Plan Land Cover Types in the Project Study Area

SCVHP Land Cover Type	Description
Upland Forests and Woodlands	
Blue oak woodland	Dominant on xeric slopes in the vicinity of Pacheco Reservoir; generally absent from the floodplains and riparian corridors of Pacheco Creek in the downstream portion of the Project study area. Mostly occurs as an open-canopy savanna with an understory heavily dominated by nonnative annual grasses such as slim oat (*Avena barbata*) (NL) or soft brome (*Bromus hordeaceus*) (FACU) with little to no shrub cover.
Coast live oak forest and woodland	Coast live oak woodland alliance stands are most common on the slopes around Pacheco Reservoir, in the northern portion of the Project study area, and occur along North Fork Pacheco Creek downstream of the Pacheco Reservoir. Dominated by coast live oak (*Quercus agrifolia*) (NL) but often occurs in mixed stands, California bay (*Umbellularia californica*) (FAC), or other trees. Found both on xeric slopes and in mesic areas on north-slopes and in riparian corridors. The understory may be dominated by nonnative annual grasses or by shrubs such as California sagebrush (*Artemisia californica*) (NL), chamise (*Adenostoma fasciculatum*) (NL), or poison oak (*Toxicodendron diversifolia*) (FACU).
Valley oak woodland	Valley oak woodland alliance occurs in the Project study area on terraces and lower slopes around Pacheco Reservoir and downstream along near the confluence of the North and South Fork Pacheco Creek confluence. Heavily dominated by valley oak (*Quercus lobata*) (FACU) with lower cover of other trees such as coast live oak in some stands. Trees are often widely spaced with an understory dominated by nonnative annual grasses. Valley oaks in stands associated with riparian habitat along Pacheco Creek are often co-dominant with coast live oak.
Mixed evergreen forest	One alliance in the Project study area falls into this cover type: California buckeye groves, which occurs in relatively mesic areas in drainages and on north-facing slopes around Pacheco Reservoir and North Fork Pacheco Creek. California buckeye groves are heavily dominated by California buckeye (*Aesculus californica*) (NL) with low cover of California bay, coast live oak, or foothill pine in some stands. The understory is relatively sparse with low cover of shrubs such as poison oak or scrub oak (*Quercus berberidifolia*) (NL).
Riparian Forests, Woodlands, and Scrub	
Central California sycamore alluvial woodland	Associated with seasonal drainages and floodplains in the Project study area, both upstream and downstream of Pacheco Reservoir. On deep, fine textured soils, this type occurs as a mixed woodland where California sycamore (*Platanus racemosa*) (FAC) is co-dominant with other trees such as coast live oak. Central California sycamore alluvial woodland also occurs on the portion of North Fork Pacheco Creek downstream of the existing Pacheco Reservoir and along South Fork Pacheco Creek. In these areas, California sycamore woodlands are generally dominated by widely-spaced California sycamores with barren, coarse-textured alluvial substrates with mulefat (*Baccharis salicifolia*) (FAC) or annual grasses dominating the understory.
Willow riparian forests, woodlands, and scrub	In the Project study area, this type is heavily dominated by red willow with low to moderate cover of other riparian trees such as black cottonwood, box-elder, Fremont cottonwood (*Populus fremontii*) (FAC), or California sycamore. The understory is often dominated by arroyo willow (*Salix lasiolepis*) (FACW).

SCVHP Land Cover Type	Description
Shrublands	
Northern coastal scrub/Diablan sage scrub	Northern coastal scrub/Diablan coastal scrub communities are typically dominated by California sagebrush and black sage (*Salvia mellifera*) (NL), with associated species including coyote brush, California buckwheat (*Eriogonum fasciculatum*) (NL), poison-oak, and sticky monkey flower (*Diplacus aurantiacus*) (FACU). The California sagebrush alliance occurs on xeric slopes around Pacheco Reservoir and the upstream portions of the Project study area. The California sagebrush-black sage scrub alliance occurs in the Project study area on steep slopes, primarily east of the existing Pacheco Reservoir. Stands dominated by California buckwheat are present in the Project study area on disturbed cut and fill slopes along State Route 152.
Northern mixed chaparral/chamise chaparral	Dominant shrubs in this land cover type in the Project study area are chamise, scrub oak (*Quercus berberidifolia*) (NL), California bay, birchleaf mountain-mahogany (*Cercocarpus betuloides*) (NL), buck brush (*Ceanothus cuneatus*) (NL), holly leaf cherry (*Prunus ilicifolia*) (NL), and poison-oak. Common associate species in this type include toyon (*Heteromeles arbutifolia*) (NL) and coffeeberry (*Frangula californica*) (NL).
Upland Herbaceous Vegetation	
California annual grassland	Wild oats and annual brome grasslands is one of the most abundant vegetation communities in the Project study area. This alliance is the dominant vegetation community of all upland herbaceous vegetation in the Project study area. Wild oats and annual brome grasslands in the Project study area are dominated by upland grasses such as ripgut brome (*Bromus diandrus*) (NL), slim oat, and soft brome. This land cover type is also found in more heavily disturbed areas where weedy forbs, including yellow starthistle (*Centaurea solstitialis*) (NL), poison hemlock (*Conium maculatum*) (FACW), perennial pepperweed (*Lepidium latifolium*) (FAC), charlock (*Sinapis arvensis*) (NL), milk thistle (*Silybum marianum*) (NL), or mustard (*Hirschfeldia incana*) (NL), are dominant.
Non-serpentine native grassland	Non-serpentine native grasslands generally occur in small patches within a larger annual grassland matrix. These grasslands are characterized by native perennial grass species such as purple needlegrass (*Stipa pulchra*) (NL) with nonnative grasses still being dominant or codominant. In the Project study area, grasslands characterized by purple needlegrass occur in relatively low abundance on upland slopes in the vicinity of Pacheco Reservoir.
Other Land Cover Types	
Barren	These are non-agricultural areas that have been historically and recently disturbed.
Rural residential	This land cover type is similar to the urban-suburban type except that it is typically much less dense (defined as less than 1 structure per 2.5 acres) and usually contains extensive landscaping and/or irrigated lands (including small areas of pasture).
Urban-suburban	Urban areas occur in relatively low abundance, primarily in the downstream portion of the Project study area near Pacheco Creek. This land cover comprises areas where the native vegetation has been cleared for residential, commercial, industrial, transportation, or recreational structures, and is defined as one or more structures per 2.5 acres. These include areas that have structures, paved and impermeable surfaces (e.g., access routes and staging areas) and horticultural plantings (e.g., ornamental woodlands).

Sources: Santa Clara Valley Habitat Agency 2012, Valley Water 2020

Chapter 6. Aquatic Resources Delineation Results

Features qualifying as waters of the United States and/or state are depicted on the aquatic resource delineation maps in Exhibit 3D and Exhibit 3E of this attachment, respectively. Delineation data points are also depicted on the aquatic resources delineation maps and are cross-referenced to the wetland determination data forms provided in Exhibit 3A of this attachment. Descriptions of the aquatic resources in the Project study area are included below and representative photographs of each aquatic resource type are provided in Exhibit 3F.

A total of 12.858 acres of potentially jurisdictional waters of the State of California are located within the 55-acre Project study area. Of this, 9.350 acres are considered potentially jurisdictional waters of the U.S. The Project study area contains 9.841 acres of other waters, consisting of 0.065 acre of intermittent streams, 0.118 acre of ephemeral streams, 6.467 acres of reservoir, and 3.191 acres of reservoir shoreline. All other waters of the State are under the jurisdiction of both the State Water Resources Control Board (SWRCB) and CDFW. Approximately 3 acres of wetland features are present consisting of 3.017 acres of seasonal wetland (Table 6-1). A complete inventory of the aquatic resources delineated, along with their Cowardin classification code, area, waters type, and coordinates is provided in Exhibit 3G of this attachment using the USACE aquatic resources spreadsheet template version 04-June-2023.

Table 6-1 Aquatic Resources in the Project Study Area

Resource Type (Map Code)	Waters of the State (portion also considered Waters of the U.S.)[1]	
	Area (acres)	Length (feet)
Other (Non-Wetland) Waters		
Riverine Intermittent Streams (RVI)	0.065 (0.031)	151 (70)
Riverine Ephemeral Streams (RVE)	0.118 (0.000)	1,997 (0)
Lake and Reservoirs (RES)	6.467 (6.467)	-
Reservoir Shoreline[2]	3.191 (0.000)	
Subtotal Other Waters	9.841 (6.498)	2,148 (70)
Wetlands		
Seasonal Wetland (SWD)[3]	3.017 (2.852)	-
Subtotal Wetlands	3.017 (2.852)	-
Total Aquatic Resources in Study Area	12.858 (9.350)	2,148 (70)

[1] Acreages in parentheses are considered jurisdictional to both the U.S. and State (SWRCB and CDFW)
[2] Reservoir shoreline consists of areas above the OHWM of the existing reservoir and the full-pool elevation of 472 feet above mean sea level. This acreage does not include other wetlands/other waters types.
[3] Due to being located above the full-pool line of the reservoir, a 0.165-acre subset of the total seasonal wetland acreage is only SWRCB-jurisdictional.

6.1 Other Waters

Other waters are non-wetland aquatic resources with an OHWM, including lakes, rivers, sloughs, ponds, and perennial, intermittent, or ephemeral streams. Other waters in the Project study area consist of intermittent drainages, ephemeral drainages, and Pacheco Reservoir. These features were delineated based on their OHWM. Descriptions of the features of other waters in the

following section are based on OHWM data forms which were recorded in areas outside of the Project study area but within the PREP study area in representative features.

6.1.1 Riverine Intermittent

Approximately 0.065 acre of riverine intermittent streams in the Project study area were delineated as potentially jurisdictional features under either Section 404 of the CWA or the Porter-Cologne Water Quality Control Act because they have an OHWM and support continuous flow at least seasonally. Intermittent drainages, specifically the portions of North Fork Pacheco Creek and South Fork Pacheco Creek in the Project study area are considered potentially jurisdictional under Section 404 of the CWA, because they are tributary to other waters with a nearly perennial direct surface connection to the Pajaro River, a TNW. Therefore, these two tributaries contribute surface flow to a TNW in a typical year and are considered waters of the United States and state. There are also portions of unnamed intermittent streams in the Project study area that would be considered waters of the state. Intermittent streams in the Project study area generally have bedrock or boulder and cobble beds. The OHWM of intermittent streams was delineated based on indicators such as changes in average sediment texture, water stains on rock, changes in vegetation species composition and cover, drift deposits, cut banks, and break in slope.

6.1.2 Riverine Ephemeral

Approximately 0.118 acre of riverine ephemeral stream occurs in the Project study area. These ephemeral streams are generally on moderately steep to steep slopes and drain to intermittent streams, including North Fork Pacheco Creek or to Pacheco Reservoir. Although most of the ephemeral streams are tributary to other waters, they flow only in direct response to precipitation and do not support continuous flow at least seasonally. Vegetation in the ephemeral stream channels generally consists of upland grasses and forbs. Vegetative cover ranges from relatively dense to sparse depending on the depth of soil. Many of the ephemeral streams have bedrock or boulder beds with little to no vegetation. The OHWM of ephemeral streams was delineated based on indicators such as changes in average sediment texture, changes in vegetation cover, and break in slope. According to the 2023 Sackett ruling, ephemeral features, including ephemeral streams, are not waters of the United States. However, these features would be considered waters of the state and regulated as such under the Porter-Cologne Water Quality Control Act.

6.1.3 Reservoirs

A single reservoir occurs within the Project study area. Pacheco Reservoir is an impoundment of North Fork Pacheco Creek created through the construction of North Fork Dam in 1939. Vegetation below the OHWM of the reservoir consists primarily of seasonal wetlands dominated by cocklebur (*Xanthium strumarium* [FAC]) patches, which are described in more detail in Section 6.2.1. Approximately 6.467 acres of reservoir was delineated in the Project study area. Pacheco Reservoir is considered a jurisdictional water of the United States and state because it contributes flow to the Pajaro River, a TNW, in a typical year, through Pacheco Creek.

6.1.3.1 Reservoir Shoreline

Based on the design of the existing Pacheco Dam, Pacheco Reservoir has a maximum full-pool elevation of 472 feet above mean sea level. Due to variability in seasonal precipitation and the resulting inflows from North Fork Pacheco Creek, along with annual changes in dam operations, the OWHM is below the full-pool elevation of the reservoir. As a result, there are 3.191 acres of reservoir shoreline above the OHWM of the reservoir within the Project study area that do not contain other types of aquatic resource types. Vegetation along the shoreline is generally sparse and consists primarily of open ground or sparse annual grasses due to occasional inundation. Reservoir shorelines are considered waters of the state and regulated under the Porter-Cologne

Water Quality Control Act and the California Fish and Game Code. Because the full-pool elevation does not represent the OHWM of Pacheco Reservoir, this aquatic resource is not considered a waters of the United States.

6.2 Wetlands

6.2.1 Seasonal Wetlands

Approximately 3.017 acres of seasonal wetlands are present in the Project study area. Seasonal wetlands in the Project study area occur in hillside seeps, small depressions, and swales, or within small stock ponds that dry up in summer. These wetlands support vegetation characterized by Baltic rush, spike rush (*Eleocharis macrostachya*) (OBL), hyssop loosestrife (*Lythrum hyssopifolia*) (OBL), toad rush (*Juncus bufonius*) (FACW), Mediterranean barley (*Hordeum marinum* ssp. *gussoneanum*) (FAC), Italian rye grass (*Festuca perennis*) (FAC), and rabbitsfoot grass (*Polypogon monspeliensis*) (FACW). Seasonal wetlands along the shoreline of Pacheco Reservoir support extensive patches of cocklebur. These wetlands are classified, according to the Cowardin classification system, as palustrine emergent nonpersistent (FGDC 2013).

Soils in the seasonal wetlands were characterized by hydric soil indicators including depleted matrix, loamy gleyed matrix, and redox dark surface. Saturation, surface water, oxidized rhizospheres along living root channels, and high-water table are primary indicators of wetland hydrology that were observed in the seasonal wetlands. Wetland determination data forms 7013, 7015, 7016, 7019, 7020, and 7024 in Exhibit 3A of this attachment provide information about the seasonal wetlands in and around the Project study area.

Seasonal wetlands in the Project study area were delineated as potentially jurisdictional wetlands based on dominance by hydrophytic plant species, wetland hydrology, hydric soils, and adjacency to other waters of the United States. Many of the seasonal wetlands in the Project study area are within Pacheco Reservoir and would therefore qualify as wetland waters of the United States and state. However, some of the seasonal wetlands in the Project study area are within or adjacent to ephemeral streams or on hillsides that are not adjacent to Pacheco Reservoir. Because these features do not have a persistent surface connection to a perennial or nearly perennial feature that flows to a TNW (e.g., Pacheco Reservoir), these wetlands are not considered waters of the United States and would not be subject to federal jurisdiction under Section 404 of the CWA. These wetlands would meet the state definition of wetlands (California Water Boards 2020) and would be considered wetland waters of the state under the Porter-Cologne Water Quality Control Act.

Chapter 7. References

Baldwin, B.G., D.H. Goldman, D.J. Keil, R. Patterson, T.J. Rosatti, and D.H. Wilken (eds.). 2012. *The Jepson Manual: Vascular Plants of California*, Second Edition. Berkeley: University of California Press.

California Native Plant Society. 2023. A Manual of California Vegetation Online. Available: https://vegetation.cnps.org/. Accessed March 2019 and October 2022.

California Water Boards. 2020. State Water Resources Control Board and Regional Water Quality Control Boards. State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State. Adopted April 2, 2020.

Curtis, K.E. and R.W. Lichvar. 2010. Updated Datasheet for the Identification of the Ordinary High-Water Mark (OHWM) in the Arid West Region of the Western United States. (Technical Report ERDC/CRREL TN-10-1.) U.S. Army Corps of Engineers Research and Development Center, Cold Regions Research and Engineering Laboratory. Hanover, NH.

Environmental Laboratory. 1987. *U.S. Army Corps of Engineers Wetlands Delineation Manual*. (Technical Report Y-87-1.) U.S. Army Corps of Engineers Waterways Experiment Station. Vicksburg, MS.

———. 2008. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0). (Technical Report ERDC/EL TR-08-28.) U.S. Army Corps of Engineers, Engineers Research and Development Center. Vicksburg, MS.

Federal Geographic Data Committee. 2013. *Classification of Wetlands and Deepwater Habitats of the United States*. Adapted from Cowardin, Carter, Golet, and LaRoe (1979). FGDC-STD-004-2013. Second Edition. Wetlands Subcommittee, Federal Geographic Data Committee and U.S. Fish and Wildlife Service, Washington, DC.

FGDC. *See* Federal Geographic Data Committee.

Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016. The National Wetland Plant List Available: http://wetland_plants.usace.army. mil/ . Accessed March 26, 2019 and November 1, 2022.

Lichvar, RW and S. M. McColley. 2008. A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the United States, a Delineation Manual. (Technical Report ERDC/CRREL TR-08-12.) U.S. Army Corps of Engineers Research and Development Center, Cold Regions Research and Engineering Laboratory. Hanover, NH.

Natural Resources Conservation Service (NRCS). 1969. Soil Survey of San Benito County, California. Survey Area CA069. https://www.nrcs.usda.gov/Internet/FSE_MANUSCRIPTS/california/sanbenitoCA1969/sanbenitoCA1969.pdf.

———. 1974. Soil Survey of Eastern Santa Clara Area, California. Survey Area CA646. https://www.nrcs.usda.gov/Internet/FSE_MANUSCRIPTS/california/SantaClaraCA1974/SantaClaraCA_1974.pdf.

———. 2018. Field Indicators of Hydric Soils in the United States, A Guide for Delineating Hydric Soils, Version 8.2. L.M. Vasilas, G.W. Hurt, and J.F. Berkowitz (eds.). USDA, NRCS, in cooperation with the National Technical Committee for Hydric Soils.

———. 2023a. National Hydric Soils List. Available: http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/use/hydric/. Accessed November 1, 2023.

———. 2023b. State Soil Data Access (SDA) Hydric Soils List. Available: https://www.nrcs.usda.gov/publications/query-by-state.html. Accessed: 2023.

———. 2020b. Official Soil Series Descriptions. Lincoln, NE: United States Department of Agriculture. Available: https://soilseries.sc.egov.usda.gov/

National Oceanic and Atmospheric Administration. 2023a. California Nevada River Forecast Center: Monthly Precipitation Summary Water Year 2019. Available: https://www.cnrfc.noaa.gov/monthly_precip.php. Accessed March 19, 2019 and November 1, 2023.

———. 2023b. CNRFC - California Nevada River Forecast Center (noaa.gov). Available: https://www.cnrfc.noaa.gov/. Accessed March 31, 2020 and November 1, 2023.

NOAA. *See* National Oceanic and Atmospheric Administration.

NRCS. *See* Natural Resources Conservation Service.

San Benito County. 2015. San Benito County 2035 General Plan Revised Draft EIR. Prepared by: EMC Planning Group Inc., Monterey, CA.

Santa Clara County. 1994. Santa Clara County General Plan. Adopted: December 20, 1994.

Santa Clara County, City of San Jose, City of Morgan Hill, City of Gilroy, Santa Clara Valley Water District, and Santa Clara Valley Transportation Authority. 2010. Santa Clara Valley Habitat Plan Environmental Impact Statement. Santa Clara County, CA. Prepared by ICF International. San Francisco, CA.

Santa Clara Valley Habitat Agency. 2012. Final Santa Clara Valley Habitat Plan. Prepared for Santa Clara County, City of Gilroy, City of Morgan Hill, City of San Jose, Santa Clara Valley Transportation Authority, and Santa Clara Valley Water District. Prepared by ICF International. San Francisco, CA. August 2012. Available: http://scv-habitatagency.org/178/Final-Habitat-Plan. Accessed March 19, 2019.

Sawyer, J.O., T. Keeler-Wolf, and J.E. Evens. 2009. *A Manual of California Vegetation*. Second Edition. Sacramento: California Native Plant Society.

USACE. *See* U.S. Army Corps of Engineers.

U.S. Army Corps of Engineers. 2016a. *Minimum Standards for Acceptance of Aquatic Resources Delineation Reports, with Template*. January 2016. Available: http://www.spk.usace.army.mil/Portals/12/documents/regulatory/jd/minimum-standards/Minimum_Standards_for_Delineation_with_Template-final.pdf. Accessed: June 2023

———. 2016b. Updated Map and Drawing Standards for the South Pacific Division Regulatory Program. February 10. Available: http://www.spd.usace.army.mil/Portals/13/docs/regulatory/standards/MapStand020816.pdf Accessed March 19, 2019.

U.S. Fish and Wildlife Service. 2023. The National Wetlands Inventory: Wetlands Mapper. Available: https://www.fws.gov/wetlands/. Accessed March 19, 2019.

USFWS. *See* U.S. Fish and Wildlife Service.

Valley Water. 2018. Valley Water Open Data. Available: https://data-valleywater.opendata.arcgis.com/. Accessed March 19, 2019.

———. 2020. Terrestrial Vegetation Mapping Technical Memorandum. Pacheco Reservoir Expansion Project. Prepared by AECOM, Stantec, and GEI.

Vepraskas, M.J. 1994. Redoximorphic Features for Identifying Aquic Conditions. (Technical bulletin 301.) North Carolina Agricultural Research Service, North Carolina State University. Raleigh, NC.

Appendix D: Biological Resources

Pacheco Reservoir Expansion Project Design Level Geotechnical Investigations

Attachment 3 - Exhibits 3A through 3G

- Exhibit 3A. Wetland Determination Data Forms
- Exhibit 3B. Plant List
- Exhibit 3C. Soils Maps and Table
- Exhibit 3D. Waters of United States
- Exhibit 3E. Waters of State
- Exhibit 3F. Photos
- Exhibit 3G. Aquatic Resources Excel Spreadsheet

Appendix D: Biological Resources

Pacheco Reservoir Expansion Project Design Level Geotechnical Investigations

Attachment 3 - Aquatic Resources Delineation

Exhibit 3A. Wetland Determination Data Forms

Stantec

RW-1

Data Point 1
Feature Type Riparian wetland

Wetland Determination Data Form–Arid West Region

Project/Site: Pacheco Reservoir Expansion City/County: Santa Clara Date: 5/21/19
Applicant/Owner: SCVWD State: CA
Investigator(s): Nick Eide, Tim Hanson, Kurt Bainbridge Section, Township, Range 10S 6E, unsectioned
Landform (hillslope, terrace, etc.) Creek floodplain Local relief (concave, convex, none) Concave Slope % 2
Subregion (LRR): C Lat: 37.03771 Long: -121.29462 Datum: NAD 83
Soil Map Unit Name: Pleasanton gravelly loam 9-15% slopes NWI Classification: None
Are climatic/hydrologic conditions on the site typical for this time of year? (Y) / N *(If no, explain in Remarks.)*
Are vegetation Y / (N) soil Y / (N) or hydrology Y / (N) significantly disturbed? Are normal circumstances present? (Y) N
Are vegetation Y / (N) soil Y / (N) or hydrology Y / (N) naturally problematic? *(If needed, explain in Remarks.)*

Summary of Findings (Attach site map showing sampling point locations, transects, important features, etc.)
Hydrophytic vegetation? (Y) N Hydric soil? (Y) N Wetland hydrology? (Y) N Is sampled area a wetland? (Y) / N Other waters? Y / (N)

Evaluation of features designated "Other Waters of the United States"
Indicators: Defined bed and bank ____ Scour ____ Ordinary High Water Mark Mapped ____ Stream Width ____
Feature Designation: Perennial ____ Intermittent ____ Ephemeral ____ Blue-line on USGS Quad ____ Substrate ____
Natural Drainage ____ Artificial Drainage ____ Navigable Water ____

Remarks Riparian wetland w/in and below the ottwm of Pacheco Creek.

Vegetation (Use Scientific Names)

Tree Stratum (Plot Size: 20x20')	Absolute % Cover	Dominant Species?	Indicator Status
1. Platanus racemosa	40	Y	FAC
2. Salix lasiolepis	40	Y	FACW
3.			
4.			
50%= 40 20%= 16 Total Cover: 80			
Sapling/Shrub Stratum (Plot:____)	**% Cover**	**Species?**	**Status**
1. Toxicodendron diversilobum	5	Y	FACU
2.			
3.			
4.			
50%= 2.5 20%= 1 Total Cover: 5			
Herb Stratum (Plot Size:____)	**% Cover**	**Species?**	**Status**
1. Juncus balticus	15	Y	FACW
2. Foeniculum vulgare (fennel)	5	N	NL
3. Polypogon monspeliensis	15	Y	FACW
4.			
5.			
6.			
7.			
8.			
50%= 20 20%= 8 Total Cover: 40			
Woody/Vine Stratum (Plot:____)	**% Cover**	**Species?**	**Status**
1.			
2.			
50%=____ 20%=____ Total Cover: ____			

% Bare Ground in Herb Stratum 60 **% Cover of Biotic Crust** ____

Dominance Test Worksheet
Number of dominant species that are OBL, FACW, or FAC: 4 (A)
Total number of dominant species across all strata: 6 (B)
Percent of dominant species that are OBL, FACW, or FAC: 66% (AB)

Prevalence Index Worksheet

Total % Cover of:		Multiply by	
OBL Species	____	x 1 =	____
FACW Species	____	x 2 =	____
FAC Species	____	x 3 =	____
FACU Species	____	x 4 =	____
UPL Species	____	x 5 =	____
Column Totals	____ (A)		____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators
X Dominance Test is >50%
____ Prevalence Index is ≤ 3.0[1]
____ Morphological Adaptations[1] (provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)
[1]*Indicators of hydric soil and wetland hydrology must be present.*

Hydrophytic Vegetation? (Y) / N

Remarks Dominance of hydrophytic woody & herbaceous riparian vegetation. Bare ground composed of cobbles.

Data Point 1

Soils

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

[1]Types: C = Concentration D = Depletion RM = Reduced Matrix [2]Location: PL = Pore Lining M = Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted)

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5) (LRR C)
- ____ 1 cm Muck (A9) (LRR D)
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1)
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Loamy Mucky Mineral (F1)
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]

- ____ 1 cm Muck (A9) (LRR C)
- ____ 2 cm Muck (A10) (LRR B)
- ____ Reduced Vetric (F18)
- ____ Red Parent Materials (TF21)
- ____ Vegetated Sand/Gravel Bars
- ____ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present): Type: Rocks Depth (Inches) 8 Hydric Soil? (Y) / N

Remarks No soils. Substrate consists of cobbles & gravels. Hydric soils indicated by scar & deposition indicating frequent flooding.

Hydrology

Wetland Indicators

Primary Indicators (Any one indicator is sufficient.)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ Saturation (A3)
- ____ Water Marks (B1) (Nonriverine)
- ____ Sediment Deposits (B2) (Nonriverine)
- ____ Drift Deposits (B3) (Nonriverine)
- ____ Surface Soil Cracks (B6)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Water-Stained Leaves (B9)
- ____ Salt Crust (B11)
- ____ Biotic Crust (B12)
- ____ Aquatic Invertebrates (B13)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Plowed Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ✓ Water Marks (B1) (Riverine)
- X Sediment Deposits (B2) (Riverine)
- X Drift Deposits (B3) (Riverine)
- ____ Drainage Patterns (B10)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- ____ Shallow Aquitard (D3)
- ____ FAC-Neutral Test (D5)

Field Observations

Surface Water Present? Yes ____ No — Depth (inches) — Wetland Hydrology? Y / N

Water Table Present? Yes ____ No — Depth (inches) —

Saturation Present? Yes ____ No — Depth (inches) — *(includes capillary fringe)*

Describe Recorded Data (stream gauge, monitoring well, aerial photos, and previous inspections), if available:

Remarks Hydrology indicated by scar & deposition indicating frequent flooding

Upland pair to DP1 (RW-1)

Stantec

Data Point 2
Feature Type U-1

Wetland Determination Data Form–Arid West Region

Project/Site: Pacheco Reservoir Expansion City/County: Santa Clara Date: 5/21/19
Applicant/Owner: SCVWD State: CA
Investigator(s): Nick Eide, Tim Hanson, Kurt Bainbridge Section, Township, Range 10S, 6E, unsectioned
Landform (hillslope, terrace, etc.) Base of hillslope along creek Local relief (concave, convex, none) concave Slope % 1
Subregion (LRR): C Lat: 37.03772 Long: -121.2946 Datum: NAD83
Soil Map Unit Name: Pleasanton gravelly loam 9-15% slopes NWI Classification: None
Are climatic/hydrologic conditions on the site typical for this time of year? Y / N *(If no, explain in Remarks.)*
Are vegetation Y / (N) soil Y / (N) or hydrology Y / (N) significantly disturbed? Are normal circumstances present? (Y) / N
Are vegetation Y / (N) soil Y / (N) or hydrology Y / (N) naturally problematic? *(If needed, explain in Remarks.)*

Summary of Findings (Attach site map showing sampling point locations, transects, important features, etc.)
Hydrophytic vegetation? Y / (N) Hydric soil? Y / (N) Wetland hydrology? Y / (N) Is sampled area a wetland? Y / (N) Other waters? Y / (N)

Evaluation of features designated "Other Waters of the United States"
Indicators: Defined bed and bank ____ Scour ____ Ordinary High Water Mark Mapped ____ Stream Width ____
Feature Designation: Perennial ____ Intermittent ____ Ephemeral ____ Blue-line on USGS Quad ____ Substrate ____
Natural Drainage ____ Artificial Drainage ____ Navigable Water ____

Remarks Upland pair to RW-1

Vegetation (Use Scientific Names)

Tree Stratum (Plot Size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
50%=____ 20%=____ Total Cover:			
Sapling/Shrub Stratum (Plot: ____)	**% Cover**	**Species?**	**Status**
1.			
2.			
3.			
4.			
50%=____ 20%=____ Total Cover:			
Herb Stratum (Plot Size: 10 X 10)	**% Cover**	**Species?**	**Status**
1. Bromus hordeaceus	85	Y	FACU
2. ?	5		
3. Avena fatua	5		UPL
4. Plantago ovata	2		FACW
5.			
6.			
7.			
8.			
50%=48.5 20%=19.4 Total Cover:	97		
Woody/Vine Stratum (Plot: ____)	**% Cover**	**Species?**	**Status**
1.			
2.			
50%=____ 20%=____ Total Cover:			

% Bare Ground in Herb Stratum 3 **% Cover of Biotic Crust** —

Dominance Test Worksheet
Number of dominant species that are OBL, FACW, or FAC: 0 (A)
Total number of dominant species across all strata: 1 (B)
Percent of dominant species that are OBL, FACW, or FAC: 0 (AB)

Prevalence Index Worksheet

Total % Cover of:		Multiply by	
OBL Species	____	x 1 =	____
FACW Species	____	x 2 =	____
FAC Species	____	x 3 =	____
FACU Species	____	x 4 =	____
UPL Species	____	x 5 =	____
Column Totals	____ (A)		____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators
____ Dominance Test is >50%
____ Prevalence Index is ≤ 3.0[1]
____ Morphological Adaptations[1] (provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)
[1]*Indicators of hydric soil and wetland hydrology must be present.*

Hydrophytic Vegetation? Y (N)

Remarks Upland veg only

Data Point 2

Soils

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	7.5 3/1	98	7.5 4/6	2	C	M	Silty clay loam	

[1]Types: C = Concentration D = Depletion RM = Reduced Matrix [2]Location: PL = Pore Lining M = Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted)

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5) (LRR C)
- ____ 1 cm Muck (A9) (LRR D)
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1)
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Loamy Mucky Mineral (F1)
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]

- ____ 1 cm Muck (A9) (LRR C)
- ____ 2 cm Muck (A10) (LRR B)
- ____ Reduced Vetric (F18)
- ____ Red Parent Materials (TF21)
- ____ Vegetated Sand/Gravel Bars
- ____ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present): Type: Rocks Depth (Inches) 6" Hydric Soil? Y (N)

Remarks Soils consist of mostly silty clay loam w/ few faint redox conc. Refusal @ 6" due to Rock from remanent Stream chan[illegible]

Hydrology

Wetland Indicators

Primary Indicators (Any one indicator is sufficient.)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ Saturation (A3)
- ____ Water Marks (B1) (Nonriverine)
- ____ Sediment Deposits (B2) (Nonriverine)
- ____ Drift Deposits (B3) (Nonriverine)
- ____ Surface Soil Cracks (B6)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Water-Stained Leaves (B9)
- ____ Salt Crust (B11)
- ____ Biotic Crust (B12)
- ____ Aquatic Invertebrates (B13)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Plowed Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ____ Water Marks (B1) (Riverine)
- ____ Sediment Deposits (B2) (Riverine)
- ____ Drift Deposits (B3) (Riverine)
- ____ Drainage Patterns (B10)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Shallow Aquitard (D3)
- ____ FAC-Neutral Test (D5)

Field Observations

Surface Water Present? Yes ____ No ____ Depth (inches) ____ Wetland Hydrology? Y / (N)

Water Table Present? Yes ____ No ____ Depth (inches) ____

Saturation Present? Yes ____ No ____ Depth (inches) ____ *(includes capillary fringe)*

Describe Recorded Data (stream gauge, monitoring well, aerial photos, and previous inspections), if available:

Remarks No hydrology indicators

Stantec

RW-2

Data Point 3

Feature Type Herbacious Riparian wetland

Wetland Determination Data Form–Arid West Region

Project/Site: Pacheco Reservoir Expansion City/County: Santa Clara County Date: 5/21/19

Applicant/Owner: SCVWD State: CA

Investigator(s): Nick Eide, Tim Hanson, Kurt Bainbridge Section, Township, Range 10S, 6E, unsectioned

Landform (hillslope, terrace, etc.) Drainage Local relief (concave, convex, none) Concave Slope % 2

Subregion (LRR): C Lat: 37.03773 Long: -121.2922 Datum: NAD83

Soil Map Unit Name: Riverwash NWI Classification: None

Are climatic/hydrologic conditions on the site typical for this time of year? (Y) / N *(If no, explain in Remarks.)*

Are vegetation Y / (N) soil Y / (N) or hydrology Y / (N) significantly disturbed? Are normal circumstances present? Y / N

Are vegetation Y / (N), soil Y / (N) or hydrology Y / (N) naturally problematic? *(If needed, explain in Remarks.)*

Summary of Findings (Attach site map showing sampling point locations, transects, important features, etc.)

Hydrophytic vegetation? (Y) / N Hydric soil? Y / N Wetland hydrology? Y / N Is sampled area a wetland? Y / N Other waters? Y / N

Evaluation of features designated "Other Waters of the United States"

Indicators: Defined bed and bank ____ Scour ____ Ordinary High Water Mark Mapped ____ Stream Width ____

Feature Designation: Perennial ____ Intermittent ____ Ephemeral ____ Blue-line on USGS Quad ____ Substrate ____

Natural Drainage ____ Artificial Drainage ____ Navigable Water ____

Remarks Herbacious riparian wetland w/in and above OHWM of Pacheco creek side channel. Feature connects pond (P-1) and Pacheco Creek (PS-1).

Vegetation (Use Scientific Names)

Tree Stratum (Plot Size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
50%=____ 20%=____ Total Cover:			
Sapling/Shrub Stratum (Plot:____)	**% Cover**	**Species?**	**Status**
1.			
2.			
3.			
4.			
50%=____ 20%=____ Total Cover:			
Herb Stratum (Plot Size: 10x10')	**% Cover**	**Species?**	**Status**
1. Phyla nodiflora	5	N	FACW
2. Polypogon monspeliensis	65	Y	FACW
3. Mimulus guttatus	5	N	OBL
4. Rumex crispus	5	N	FAC
5. Eleocharis acicularis	5	N	OBL
6.			
7.			
8.			
50%=42.5 20%=17 Total Cover: 85			
Woody/Vine Stratum (Plot:____)	**% Cover**	**Species?**	**Status**
1.			
2.			
50%=____ 20%=____ Total Cover:			

% Bare Ground in Herb Stratum 15 **% Cover of Biotic Crust** 0

Dominance Test Worksheet

Number of dominant species that are OBL, FACW, or FAC: 1 (A)

Total number of dominant species across all strata: 1 (B)

Percent of dominant species that are OBL, FACW, or FAC: 100 (AB)

Prevalence Index Worksheet

Total % Cover of:		Multiply by	
OBL Species	____	x 1 =	____
FACW Species	____	x 2 =	____
FAC Species	____	x 3 =	____
FACU Species	____	x 4 =	____
UPL Species	____	x 5 =	____
Column Totals	____ (A)		____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators

X Dominance Test is >50%

____ Prevalence Index is ≤ 3.0[1]

____ Morphological Adaptations[1] (provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]*Indicators of hydric soil and wetland hydrology must be present.*

Hydrophytic Vegetation? (Y) / N

Remarks Herbacious wetland veg present w/in and above side channel OHWM

Data Point 3

Soils

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	Gley1 4/5GY	100						

[1]Types: C = Concentration D = Depletion RM = Reduced Matrix [2]Location: PL = Pore Lining M = Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted)

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5) (LRR C)
- ____ 1 cm Muck (A9) (LRR D)
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1)
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Loamy Mucky Mineral (F1)
- X Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]

- ____ 1 cm Muck (A9) (LRR C)
- ____ 2 cm Muck (A10) (LRR B)
- ____ Reduced Vetric (F18)
- ____ Red Parent Materials (TF21)
- ____ Vegetated Sand/Gravel Bars
- ____ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present): Type: Rock Depth (Inches) 4" Hydric Soil? (Y) N

Remarks Gleyed soils w/in 1st 4" of soil surface

Hydrology

Wetland Indicators

Primary Indicators (Any one indicator is sufficient.)

- X Surface Water (A1)
- ____ High Water Table (A2)
- ____ Saturation (A3)
- ____ Water Marks (B1) (Nonriverine)
- ____ Sediment Deposits (B2) (Nonriverine)
- ____ Drift Deposits (B3) (Nonriverine)
- ____ Surface Soil Cracks (B6)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Water-Stained Leaves (B9)
- ____ Salt Crust (B11)
- ____ Biotic Crust (B12)
- ____ Aquatic Invertebrates (B13)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Plowed Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ____ Water Marks (B1) (Riverine)
- ____ Sediment Deposits (B2) (Riverine)
- ____ Drift Deposits (B3) (Riverine)
- ____ Drainage Patterns (B10)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Shallow Aquitard (D3)
- ____ FAC-Neutral Test (D5)

Field Observations

Surface Water Present? Yes X No ____ Depth (inches) 1" Wetland Hydrology? (Y) / N

Water Table Present? Yes ____ No X Depth (inches) ____

Saturation Present? Yes ____ No X Depth (inches) ____ *(includes capillary fringe)*

Describe Recorded Data (stream gauge, monitoring well, aerial photos, and previous inspections), if available:

Remarks Surface water present w/in center of feature. Pit doesn't have surface water or saturation

Stantec

upland pair to DP3 (RW-2)

Data Point 4
Feature Type U-2

Wetland Determination Data Form–Arid West Region

Project/Site: Pacheco Reservoir Expansion City/County: Santa Clara Date: 5/21/19
Applicant/Owner: SCVWD State: CA
Investigator(s): Nick Eide, Tim Hansen, Kurt Bainbridge Section, Township, Range 10S, 6E, unsectioned
Landform (hillslope, terrace, etc.) Hillslope Local relief (concave, convex, none) Concave Slope % 3
Subregion (LRR): C Lat: 37.0377 Long: -121.2922 Datum: NAD83
Soil Map Unit Name: River wash NWI Classification: None
Are climatic/hydrologic conditions on the site typical for this time of year? (Y) / N *(If no, explain in Remarks.)*
Are vegetation Y / (N), soil Y / (N) or hydrology Y / (N) significantly disturbed? Are normal circumstances present? (Y) / N
Are vegetation Y / (N), soil Y / (N) or hydrology Y / (N) naturally problematic? *(If needed, explain in Remarks.)*

Summary of Findings (Attach site map showing sampling point locations, transects, important features, etc.)
Hydrophytic vegetation? Y / (N) Hydric soil? Y / (N) Wetland hydrology? Y / (N) Is sampled area a wetland? Y / (N) Other waters? Y / (N)

Evaluation of features designated "Other Waters of the United States"
Indicators: Defined bed and bank ____ Scour ____ Ordinary High Water Mark Mapped ____ Stream Width ____
Feature Designation: Perennial ____ Intermittent ____ Ephemeral ____ Blue-line on USGS Quad ____ Substrate ____
Natural Drainage ____ Artificial Drainage ____ Navigable Water ____

Remarks Upland pair to DP3 (RW-2)

Vegetation (Use Scientific Names)

Tree Stratum (Plot Size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
50%=____ 20%=____ Total Cover:			
Sapling/Shrub Stratum (Plot:____)	**% Cover**	**Species?**	**Status**
1.			
2.			
3.			
4.			
50%=____ 20%=____ Total Cover:			
Herb Stratum (Plot Size: 10X10)	**% Cover**	**Species?**	**Status**
1. Bromus hordeaceus	70	Y	FACU
2. Lolium perenne (f. perenne)	5	N	FAC
3. Plantago lanceolata	15	N	FAC
4. Medicago polymorpha	5	N	FACU
5.			
6.			
7.			
8.			
50%=47.5 20%=19 Total Cover:	95		
Woody/Vine Stratum (Plot:____)	**% Cover**	**Species?**	**Status**
1.			
2.			
50%=____ 20%=____ Total Cover:			

% Bare Ground in Herb Stratum 5 **% Cover of Biotic Crust** 0

Dominance Test Worksheet
Number of dominant species that are OBL, FACW, or FAC: 0 (A)
Total number of dominant species across all strata: 1 (B)
Percent of dominant species that are OBL, FACW, or FAC: 0 (AB)

Prevalence Index Worksheet

Total % Cover of:		Multiply by	
OBL Species	____	x 1 =	____
FACW Species	____	x 2 =	____
FAC Species	____	x 3 =	____
FACU Species	____	x 4 =	____
UPL Species	____	x 5 =	____
Column Totals	____ (A)		____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators
____ Dominance Test is >50%
____ Prevalence Index is ≤ 3.0[1]
____ Morphological Adaptations[1] (provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)
[1]*Indicators of hydric soil and wetland hydrology must be present.*

Hydrophytic Vegetation? Y (N)

Remarks Area dominated by upland vegetation

Data Point 4

Soils

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	7.5YR 3/1	100						Sandy loam

[1]Types: C = Concentration D = Depletion RM = Reduced Matrix [2]Location: PL = Pore Lining M = Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted)

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5) (LRR C)
- ____ 1 cm Muck (A9) (LRR D)
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1)
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Loamy Mucky Mineral (F1)
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]

- ____ 1 cm Muck (A9) (LRR C)
- ____ 2 cm Muck (A10) (LRR B)
- ____ Reduced Vetric (F18)
- ____ Red Parent Materials (TF21)
- ____ Vegetated Sand/Gravel Bars
- ____ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present): Type: Rock Depth (Inches) 6 Hydric Soil? Y / (N)

Remarks No soils. Refusal @ 6" due to rocks.

Hydrology

Wetland Indicators

Primary Indicators (Any one indicator is sufficient.)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ Saturation (A3)
- ____ Water Marks (B1) (Nonriverine)
- ____ Sediment Deposits (B2) (Nonriverine)
- ____ Drift Deposits (B3) (Nonriverine)
- ____ Surface Soil Cracks (B6)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Water-Stained Leaves (B9)
- ____ Salt Crust (B11)
- ____ Biotic Crust (B12)
- ____ Aquatic Invertebrates (B13)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Plowed Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ____ Water Marks (B1) (Riverine)
- ____ Sediment Deposits (B2) (Riverine)
- ____ Drift Deposits (B3) (Riverine)
- ____ Drainage Patterns (B10)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Shallow Aquitard (D3)
- ____ FAC-Neutral Test (D5)

Field Observations

Surface Water Present? Yes ____ No X Depth (inches) ____ Wetland Hydrology? Y / (N)

Water Table Present? Yes ____ No X Depth (inches) ____

Saturation Present? Yes ____ No X Depth (inches) ____ *(includes capillary fringe)*

Describe Recorded Data (stream gauge, monitoring well, aerial photos, and previous inspections), if available:

Remarks No hydrology

Stantec

Data Point 5
Feature Type Pond

Wetland Determination Data Form–Arid West Region

Project/Site: Pacheco Reservoir Expansion City/County: Santa Clara County Date: 5/21/19
Applicant/Owner: SCVWD State: CA
Investigator(s): Nick Eide, Tim Hanson, Kurt Bainbridge Section, Township, Range 10S, 6E, unsectioned
Landform (hillslope, terrace, etc.) Drainage Local relief (concave, convex, none) Concave Slope % 1
Subregion (LRR): C Lat: 37.0381 Long: -121.2920 Datum: NAD83
Soil Map Unit Name: Riverwash NWI Classification: None
Are climatic/hydrologic conditions on the site typical for this time of year? (Y) / N *(If no, explain in Remarks.)*
Are vegetation Y / (N) soil Y / (N) or hydrology Y / (N) significantly disturbed? Are normal circumstances present? (Y) / N
Are vegetation Y / (N) soil Y / (N) or hydrology Y / (N) naturally problematic? *(If needed, explain in Remarks.)*

Summary of Findings (Attach site map showing sampling point locations, transects, important features, etc.)
Hydrophytic vegetation? Y / (N) Hydric soil? Y / (N) Wetland hydrology? Y / (N) Is sampled area a wetland? Y / (N) Other waters? (Y) / N

Evaluation of features designated "Other Waters of the United States"
Indicators: Defined bed and bank X Scour ____ Ordinary High Water Mark Mapped X Stream Width ____
Feature Designation: Perennial X Intermittent ____ Ephemeral ____ Blue-line on USGS Quad ____ Substrate ____
Natural Drainage ____ Artificial Drainage ____ Navigable Water ____

Remarks Pond w/in depressed area of side channel. ~5-10' wide. DP documents pond OHWM.

Vegetation (Use Scientific Names)

Tree Stratum (Plot Size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
50%=____ 20%=____ Total Cover:			
Sapling/Shrub Stratum (Plot:____)	**% Cover**	**Species?**	**Status**
1.			
2.			
3.			
4.			
50%=____ 20%=____ Total Cover:			
Herb Stratum (Plot Size:____)	**% Cover**	**Species?**	**Status**
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
50%=____ 20%=____ Total Cover:			
Woody/Vine Stratum (Plot:____)	**% Cover**	**Species?**	**Status**
1.			
2.			
50%=____ 20%=____ Total Cover:			

% Bare Ground in Herb Stratum ____ **% Cover of Biotic Crust** ____

Dominance Test Worksheet
Number of dominant species that are OBL, FACW, or FAC: ____ (A)
Total number of dominant species across all strata: ____ (B)
Percent of dominant species that are OBL, FACW, or FAC: ____ (AB)

Prevalence Index Worksheet

Total % Cover of:		Multiply by	
OBL Species	____	x 1 =	____
FACW Species	____	x 2 =	____
FAC Species	____	x 3 =	____
FACU Species	____	x 4 =	____
UPL Species	____	x 5 =	____
Column Totals	____ (A)		____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators
____ Dominance Test is >50%
____ Prevalence Index is ≤ 3.0[1]
____ Morphological Adaptations[1] (provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)
[1]*Indicators of hydric soil and wetland hydrology must be present.*

Hydrophytic Vegetation? Y / N

Remarks Perennially inundated pond, not vegetated

Data Point 5

Soils

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

[1]Types: C = Concentration D = Depletion RM = Reduced Matrix [2]Location: PL = Pore Lining M = Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted)

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5) (LRR C)
- ____ 1 cm Muck (A9) (LRR D)
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1)
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Loamy Mucky Mineral (F1)
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]

- ____ 1 cm Muck (A9) (LRR C)
- ____ 2 cm Muck (A10) (LRR B)
- ____ Reduced Vetric (F18)
- ____ Red Parent Materials (TF21)
- ____ Vegetated Sand/Gravel Bars
- ____ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present): Type: _____ Depth (Inches) _____ Hydric Soil? Y / (N)

Remarks No soil pit. Other water feature that drains to Pacheco creek

Hydrology

Wetland Indicators

Primary Indicators (Any one indicator is sufficient.)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ Saturation (A3)
- ____ Water Marks (B1) (Nonriverine)
- ____ Sediment Deposits (B2) (Nonriverine)
- ____ Drift Deposits (B3) (Nonriverine)
- ____ Surface Soil Cracks (B6)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Water-Stained Leaves (B9)
- ____ Salt Crust (B11)
- ____ Biotic Crust (B12)
- ____ Aquatic Invertebrates (B13)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Plowed Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- X Water Marks (B1) (Riverine)
- X Sediment Deposits (B2) (Riverine)
- ____ Drift Deposits (B3) (Riverine)
- ____ Drainage Patterns (B10)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Shallow Aquitard (D3)
- ____ FAC-Neutral Test (D5)

Field Observations

Surface Water Present? Yes X No ____ Depth (inches) several feet Wetland Hydrology? Y (N)

Water Table Present? Yes ____ No ____ Depth (inches) _____

Saturation Present? Yes ____ No ____ Depth (inches) _____ *(includes capillary fringe)*

Describe Recorded Data (stream gauge, monitoring well, aerial photos, and previous inspections), if available:

Remarks Ofturn indicated by water marks, sediment deposits, shelving/break in slope.

Stantec

RW-3

Data Point 6
Feature Type Riparian wetland

Wetland Determination Data Form–Arid West Region

Project/Site: Pacheco Reservoir Project City/County: Santa Clara Co Date: 5/21/14
Applicant/Owner: SCVWD State: CA
Investigator(s): Nick Eide, Tim Hanson, Kurt Bainbridge Section, Township, Range 10S, 6E, unsectioned
Landform (hillslope, terrace, etc.) Flood channel Local relief (concave, convex, none) concave Slope % 2
Subregion (LRR): C Lat: 37.0384 Long: -121.2920 Datum: NAD83
Soil Map Unit Name: Riverwash NWI Classification: None
Are climatic/hydrologic conditions on the site typical for this time of year? (Y) N *(If no, explain in Remarks.)*
Are vegetation Y / (N) soil Y / (N) or hydrology Y (N) significantly disturbed? Are normal circumstances present? (Y) N
Are vegetation Y / (N) soil Y / (N) or hydrology Y / (N) naturally problematic? *(If needed, explain in Remarks.)*

Summary of Findings (Attach site map showing sampling point locations, transects, important features, etc.)
Hydrophytic vegetation? (Y) N Hydric soil? (Y) N Wetland hydrology? (Y) N Is sampled area a wetland? (Y) N Other waters? (Y) N

Evaluation of features designated "Other Waters of the United States"
Indicators: Defined bed and bank X Scour X Ordinary High Water Mark Mapped X Stream Width 30
Feature Designation: Perennial ____ Intermittent ____ Ephemeral ____ Blue-line on USGS Quad ____ Substrate cobble/gravel
Natural Drainage ____ Artificial Drainage ____ Navigable Water ____

Remarks Side flood channel w/ facaltaive vegetation w/in ohwm. Wetland soils and hydrology met by

Vegetation (Use Scientific Names)

Tree Stratum (Plot Size: 10x10)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix lasiolepis	90	Y	FACW
2. Platanus racemosa	10	Y	FAC
3.			
4.			
50%=15 20%=6 Total Cover:	30		

Sapling/Shrub Stratum (Plot:____)	% Cover	Species?	Status
1.			
2.			
3.			
4.			
50%=____ 20%=____ Total Cover:			

Herb Stratum (Plot Size: 10x10')	% Cover	Species?	Status
1. Juncus bufonius	30	Y	FACW
2. Polypogon monspeliensis	30	Y	FACW
3.			
4.			
5.			
6.			
7.			
8.			
50%=30 20%=12 Total Cover:	60		

Woody/Vine Stratum (Plot:____)	% Cover	Species?	Status
1.			
2.			
50%=____ 20%=____ Total Cover:			

% Bare Ground in Herb Stratum 40 **% Cover of Biotic Crust** 0

Dominance Test Worksheet
Number of dominant species that are OBL, FACW, or FAC: 4 (A)
Total number of dominant species across all strata: 4 (B)
Percent of dominant species that are OBL, FACW, or FAC: 100 (AB)

Prevalence Index Worksheet

Total % Cover of:		Multiply by	
OBL Species	____	x 1 =	____
FACW Species	____	x 2 =	____
FAC Species	____	x 3 =	____
FACU Species	____	x 4 =	____
UPL Species	____	x 5 =	____
Column Totals	____ (A)		____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators
X Dominance Test is >50%
____ Prevalence Index is ≤ 3.0[1]
____ Morphological Adaptations[1] (provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)
[1]*Indicators of hydric soil and wetland hydrology must be present.*

Hydrophytic Vegetation? (Y) N

Remarks Hydrophytic veg w/ ohwm & location

Data Point 6

Soils

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

[1]Types: C = Concentration D = Depletion RM = Reduced Matrix [2]Location: PL = Pore Lining M = Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted)

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5) (LRR C)
- ____ 1 cm Muck (A9) (LRR D)
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1)
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Loamy Mucky Mineral (F1)
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]

- ____ 1 cm Muck (A9) (LRR C)
- ____ 2 cm Muck (A10) (LRR B)
- ____ Reduced Vetric (F18)
- ____ Red Parent Materials (TF21)
- ____ Vegetated Sand/Gravel Bars
- ____ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present): Type: Rock Depth (Inches) 0 Hydric Soil? Y / N

Remarks No pit. Soils met by scour & drift deposits (i.e., feature frequently flooded).

Hydrology

Wetland Indicators

Primary Indicators (Any one indicator is sufficient.)

- X Surface Water (A1)
- ____ High Water Table (A2)
- ____ Saturation (A3)
- ____ Water Marks (B1) (Nonriverine)
- ____ Sediment Deposits (B2) (Nonriverine)
- ____ Drift Deposits (B3) (Nonriverine)
- ____ Surface Soil Cracks (B6)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Water-Stained Leaves (B9)
- ____ Salt Crust (B11)
- ____ Biotic Crust (B12)
- ____ Aquatic Invertebrates (B13)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Plowed Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- X Water Marks (B1) (Riverine)
- X Sediment Deposits (B2) (Riverine)
- X Drift Deposits (B3) (Riverine)
- ____ Drainage Patterns (B10)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- ____ Shallow Aquitard (D3)
- ____ FAC-Neutral Test (D5)

Field Observations

Surface Water Present? Yes X No ____ Depth (inches) 2" Wetland Hydrology? (Y) / N

Water Table Present? Yes ____ No ____ Depth (inches) ____

Saturation Present? Yes X No ____ Depth (inches) ____ *(includes capillary fringe)*

Describe Recorded Data (stream gauge, monitoring well, aerial photos, and previous inspections), if available:

Remarks Hydrology indicated by scour & drift deposits.

Upland pair to DP6 (RW-3

Stantec

Wetland Determination Data Form–Arid West Region

Data Point 7
Feature Type U-3

Project/Site: Pacheco Reservoir Project City/County: Santa Clara Date: 5/21/19
Applicant/Owner: SCVWD State: CA
Investigator(s): WS, TH, KB Section, Township, Range 10S, 6E, unsectioned
Landform (hillslope, terrace, etc.) terrace Local relief (concave, convex, none) concave Slope % 2
Subregion (LRR): C Lat: 37.0384 Long: -121.2920 Datum: NAD83
Soil Map Unit Name: Riverwash NWI Classification: None
Are climatic/hydrologic conditions on the site typical for this time of year? (Y) N *(If no, explain in Remarks.)*
Are vegetation Y (N) soil Y (N) or hydrology Y (N) significantly disturbed? Are normal circumstances present? (Y) N
Are vegetation Y (N) soil Y (N) or hydrology Y (N) naturally problematic? *(If needed, explain in Remarks.)*

Summary of Findings (Attach site map showing sampling point locations, transects, important features, etc.)
Hydrophytic vegetation? Y (N) Hydric soil? Y (N) Wetland hydrology? Y (N) Is sampled area a wetland? Y / N Other waters? Y / N

Evaluation of features designated "Other Waters of the United States"
Indicators: Defined bed and bank ____ Scour ____ Ordinary High Water Mark Mapped ____ Stream Width ____
Feature Designation: Perennial ____ Intermittent ____ Ephemeral ____ Blue-line on USGS Quad ____ Substrate ____
Natural Drainage ____ Artificial Drainage ____ Navigable Water ____

Remarks Upland data point to DP6 (RW-3)

Vegetation (Use Scientific Names)

Tree Stratum (Plot Size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
50%=____ 20%=____ Total Cover:			

Sapling/Shrub Stratum (Plot:____)	% Cover	Species?	Status
1.			
2.			
3.			
4.			
50%=____ 20%=____ Total Cover:			

Herb Stratum (Plot Size: 10 X 10)	% Cover	Species?	Status
1. Bromus hordeaceus	35	Y	FACU
2. Lolium perenne (f. perenis)	15	N	FAC
3. Hordeum marinum	25	Y	FAC
4. Plantago lanceolata	5	N	FAC
5.			
6.			
7.			
8.			
50%=40 20%=16 Total Cover:	80		

Woody/Vine Stratum (Plot:____)	% Cover	Species?	Status
1.			
2.			
50%=____ 20%=____ Total Cover:			

% Bare Ground in Herb Stratum 20 **% Cover of Biotic Crust** ____

Dominance Test Worksheet
Number of dominant species that are OBL, FACW, or FAC: 1 (A)
Total number of dominant species across all strata: 2 (B)
Percent of dominant species that are OBL, FACW, or FAC: 50 (AB)

Prevalence Index Worksheet

Total % Cover of:		Multiply by	
OBL Species		x 1 =	
FACW Species		x 2 =	
FAC Species	45	x 3 =	135
FACU Species	35	x 4 =	140
UPL Species		x 5 =	
Column Totals	80 (A)		275 (B)

Prevalence Index = B/A = 3.4

Hydrophytic Vegetation Indicators
____ Dominance Test is >50%
____ Prevalence Index is ≤ 3.0[1]
____ Morphological Adaptations[1] (provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation? Y (N)

Remarks Upland veg present

Data Point 7

Soils

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	7.5yr 3/1	100						Sandy loam

[1]Types: C = Concentration D = Depletion RM = Reduced Matrix [2]Location: PL = Pore Lining M = Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted)

- _____ Histosol (A1)
- _____ Histic Epipedon (A2)
- _____ Black Histic (A3)
- _____ Hydrogen Sulfide (A4)
- _____ Stratified Layers (A5) (LRR C)
- _____ 1 cm Muck (A9) (LRR D)
- _____ Depleted Below Dark Surface (A11)
- _____ Thick Dark Surface (A12)
- _____ Sandy Mucky Mineral (S1)
- _____ Sandy Gleyed Matrix (S4)
- _____ Sandy Redox (S5)
- _____ Stripped Matrix (S6)
- _____ Loamy Mucky Mineral (F1)
- _____ Loamy Gleyed Matrix (F2)
- _____ Depleted Matrix (F3)
- _____ Redox Dark Surface (F6)
- _____ Depleted Dark Surface (F7)
- _____ Redox Depressions (F8)
- _____ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]

- _____ 1 cm Muck (A9) (LRR C)
- _____ 2 cm Muck (A10) (LRR B)
- _____ Reduced Vetric (F18)
- _____ Red Parent Materials (TF21)
- _____ Vegetated Sand/Gravel Bars
- _____ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present): Type: Rock Depth (Inches) 4" Hydric Soil? Y (N)

Remarks Cobble / rock layer present after ~4". No hydric soils present

Hydrology

Wetland Indicators

Primary Indicators (Any one indicator is sufficient.)

- _____ Surface Water (A1)
- _____ High Water Table (A2)
- _____ Saturation (A3)
- _____ Water Marks (B1) (Nonriverine)
- _____ Sediment Deposits (B2) (Nonriverine)
- _____ Drift Deposits (B3) (Nonriverine)
- _____ Surface Soil Cracks (B6)
- _____ Inundation Visible on Aerial Imagery (B7)
- _____ Water-Stained Leaves (B9)
- _____ Salt Crust (B11)
- _____ Biotic Crust (B12)
- _____ Aquatic Invertebrates (B13)
- _____ Hydrogen Sulfide Odor (C1)
- _____ Oxidized Rhizospheres (C3)
- _____ Presence of Reduced Iron (C4)
- _____ Recent Iron Reduction in Plowed Soils (C6)
- _____ Thin Muck Surface (C7)
- _____ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- _____ Water Marks (B1) (Riverine)
- _____ Sediment Deposits (B2) (Riverine)
- _____ Drift Deposits (B3) (Riverine)
- _____ Drainage Patterns (B10)
- _____ Dry-Season Water Table (C2)
- _____ Crayfish Burrows (C8)
- _____ Saturation Visible on Aerial Imagery (C9)
- _____ Shallow Aquitard (D3)
- _____ FAC-Neutral Test (D5)

Field Observations

Surface Water Present? Yes _____ No X Depth (inches) — Wetland Hydrology? Y / (N)

Water Table Present? Yes _____ No X Depth (inches) —

Saturation Present? Yes _____ No X Depth (inches) — *(includes capillary fringe)*

Describe Recorded Data (stream gauge, monitoring well, aerial photos, and previous inspections), if available:

Remarks No hydrology indicators observed

Stantec

Wetland Determination Data Form–Arid West Region

Data Point: 8
Feature Type: Suspect Area (NW-2)

Project/Site: Pacheco Reservoir Expansion City/County: Santa Clara County Date: 5/21/19
Applicant/Owner: SCVWD State: CA
Investigator(s): Nick Eide, Tim Hanson, Kurt Bainbridge Section, Township, Range
Landform (hillslope, terrace, etc.) Hillslope Local relief (concave, convex, none) Concave Slope % 3
Subregion (LRR): C Lat: 37.0407 Long: -121.2914 Datum: NAD83
Soil Map Unit Name: Riverwash NWI Classification: None
Are climatic/hydrologic conditions on the site typical for this time of year? (Y) / N *(If no, explain in Remarks.)*
Are vegetation Y / (N) soil Y / (N) or hydrology Y / (N) significantly disturbed? Are normal circumstances present? (Y) / N
Are vegetation Y / (N) soil Y / (N) or hydrology Y / (N) naturally problematic? *(If needed, explain in Remarks.)*

Summary of Findings (Attach site map showing sampling point locations, transects, important features, etc.)
Hydrophytic vegetation? (Y) N Hydric soil? Y / (N) Wetland hydrology? Y / N Is sampled area a wetland? Y / N Other waters? Y / N

Evaluation of features designated "Other Waters of the United States"
Indicators: Defined bed and bank ____ Scour ____ Ordinary High Water Mark Mapped ____ Stream Width ____
Feature Designation: Perennial ____ Intermittent ____ Ephemeral ____ Blue-line on USGS Quad ____ Substrate ____
Natural Drainage ____ Artificial Drainage ____ Navigable Water ____

Remarks Suspect area in a valley between two hillsides. All FAC veg, but no soils or hydrology.

Vegetation (Use Scientific Names)

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot Size: ____)			
1.			
2.			
3.			
4.			
50%=____ 20%=____ Total Cover:			
Sapling/Shrub Stratum (Plot:____)	% Cover	Species?	Status
1.			
2.			
3.			
4.			
50%=____ 20%=____ Total Cover:			
Herb Stratum (Plot Size:____)	% Cover	Species?	Status
1. Lolium perenne (f. perenne)	50	Y	Fac
2. Hordeum marinum	25	Y	Fac
3. Plantago lanceolata	15	N	Fac
4. Rumex crispus	10	N	Fac
5.			
6.			
7.			
8.			
50%=____ 20%=____ Total Cover:	100		
Woody/Vine Stratum (Plot:____)	% Cover	Species?	Status
1.			
2.			
50%=____ 20%=____ Total Cover:			

% Bare Ground in Herb Stratum 0 **% Cover of Biotic Crust** 0

Dominance Test Worksheet
Number of dominant species that are OBL, FACW, or FAC: 3 (A)
Total number of dominant species across all strata: 3 (B)
Percent of dominant species that are OBL, FACW, or FAC: 100 (AB)

Prevalence Index Worksheet

Total % Cover of:		Multiply by	
OBL Species	____	x 1 =	____
FACW Species	____	x 2 =	____
FAC Species	100	x 3 =	300
FACU Species	____	x 4 =	____
UPL Species	____	x 5 =	____
Column Totals	____ (A)		____ (B)

Prevalence Index = B/A = 3.00

Hydrophytic Vegetation Indicators
X Dominance Test is >50%
X Prevalence Index is ≤ 3.0[1]
____ Morphological Adaptations[1] (provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)
[1]*Indicators of hydric soil and wetland hydrology must be present.*

Hydrophytic Vegetation? (Y) N

Remarks Marginal hydrophytic veg. present.

Data Point 8

Soils

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	7.5yr 2.5/1	100					Sandy loam	

[1]Types: C = Concentration D = Depletion RM = Reduced Matrix [2]Location: PL = Pore Lining M = Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted)

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5) (LRR C)
- ____ 1 cm Muck (A9) (LRR D)
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1)
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Loamy Mucky Mineral (F1)
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]

- ____ 1 cm Muck (A9) (LRR C)
- ____ 2 cm Muck (A10) (LRR B)
- ____ Reduced Vetric (F18)
- ____ Red Parent Materials (TF21)
- ____ Vegetated Sand/Gravel Bars
- ____ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present): Type: _____ Depth (Inches) _____ Hydric Soil? Y / (N)

Remarks No Soils. Consistent matrix composition throughout soil profile.

Hydrology

Wetland Indicators

Primary Indicators (Any one indicator is sufficient.)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ Saturation (A3)
- ____ Water Marks (B1) (Nonriverine)
- ____ Sediment Deposits (B2) (Nonriverine)
- ____ Drift Deposits (B3) (Nonriverine)
- ____ Surface Soil Cracks (B6)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Water-Stained Leaves (B9)
- ____ Salt Crust (B11)
- ____ Biotic Crust (B12)
- ____ Aquatic Invertebrates (B13)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Plowed Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ____ Water Marks (B1) (Riverine)
- ____ Sediment Deposits (B2) (Riverine)
- ____ Drift Deposits (B3) (Riverine)
- ____ Drainage Patterns (B10)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Shallow Aquitard (D3)
- ____ FAC-Neutral Test (D5)

Field Observations

Surface Water Present? Yes ____ No X Depth (inches) — Wetland Hydrology? Y / (N)

Water Table Present? Yes ____ No X Depth (inches) —

Saturation Present? Yes ____ No X Depth (inches) — *(includes capillary fringe)*

Describe Recorded Data (stream gauge, monitoring well, aerial photos, and previous inspections), if available:

Remarks no hydrology

Stantec

Data Point 11.

Wetland Determination Data Form–Arid West Region

Feature Type Suspect Wetland Area (NW-1)

Project/Site: Pacheco Reservoir Project City/County: Santa Clara Co Date: 5/22

Applicant/Owner: SCVWD State: CA 8/8

Investigator(s): Nick Eide, Tim Hansen, Kurt Bainbridge Section, Township, Range 10S, 6E, unsectioned

Landform (hillslope, terrace, etc.) valley Local relief (concave, convex, none) Concave Slope % 2

Subregion (LRR): C Lat: 37.0442 Long: -121.2890 Datum: NAD83

Soil Map Unit Name: Riverwash NWI Classification: None

Are climatic/hydrologic conditions on the site typical for this time of year? (Y) / N *(If no, explain in Remarks.)*

Are vegetation Y / (N) soil Y / (N) or hydrology Y / (N) significantly disturbed? Are normal circumstances present? (Y) / N

Are vegetation Y / (N) soil Y / (N) or hydrology Y / (N) naturally problematic? *(If needed, explain in Remarks.)*

Summary of Findings (Attach site map showing sampling point locations, transects, important features, etc.)

Hydrophytic vegetation? (Y) N Hydric soil? Y (N) Wetland hydrology? Y (N) Is sampled area a wetland? Y (N) Other waters? Y (N)

Evaluation of features designated "Other Waters of the United States"

Indicators: Defined bed and bank ____ Scour ____ Ordinary High Water Mark Mapped ____ Stream Width ____

Feature Designation: Perennial ____ Intermittent ____ Ephemeral ____ Blue-line on USGS Quad ____ Substrate ____

Natural Drainage ____ Artificial Drainage ____ Navigable Water ____

Remarks Suspect wetland area, lacks indicators of hydric soils & hydrology

Vegetation (Use Scientific Names)

Tree Stratum (Plot Size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
50%=____ 20%=____ Total Cover:			
Sapling/Shrub Stratum (Plot:____)	**% Cover**	**Species?**	**Status**
1.			
2.			
3.			
4.			
50%=____ 20%=____ Total Cover:			
Herb Stratum (Plot Size:____)	**% Cover**	**Species?**	**Status**
1. Plagiobothrys stipitatus var. micranthus	40%	Y	FACW
2. Hordeum brachyantherum	10%	N	FAC
3. Festuca perennis	25%	Y	FAC
4. Rumex crispus	5%	N	FAC
5. Polypogon monspeliensis	5%	N	FACW
6. Juncus bufonius	15%	N	FACW
7.			
8.			
50%=50 20%=20 Total Cover:	100%		
Woody/Vine Stratum (Plot:____)	**% Cover**	**Species?**	**Status**
1.			
2.			
50%=____ 20%=____ Total Cover:			

% Bare Ground in Herb Stratum ____ **% Cover of Biotic Crust** ____

Dominance Test Worksheet

Number of dominant species that are OBL, FACW, or FAC: 2 (A)

Total number of dominant species across all strata: 2 (B)

Percent of dominant species that are OBL, FACW, or FAC: 100% (AB)

Prevalence Index Worksheet

Total % Cover of:		Multiply by	
OBL Species	0	x 1 =	0
FACW Species	60	x 2 =	120
FAC Species	40	x 3 =	120
FACU Species	0	x 4 =	0
UPL Species	0	x 5 =	0
Column Totals	100 (A)		240 (B)

Prevalence Index = B/A = 2.4

Hydrophytic Vegetation Indicators

X Dominance Test is >50%

X Prevalence Index is ≤ 3.0[1]

___ Morphological Adaptations[1] (provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]*Indicators of hydric soil and wetland hydrology must be present.*

Hydrophytic Vegetation? (Y) / N

Remarks

Data Point \\

Soils

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	7.5yr 3/4	100%	—	—	—	—	SANDY, GRAVEL LOAM	
3-12	7.5yr 4/4	100%	N/A	—	—	—	LOAMY CLAY	

[1]Types: C = Concentration D = Depletion RM = Reduced Matrix [2]Location: PL = Pore Lining M = Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted)

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5) (LRR C)
- ____ 1 cm Muck (A9) (LRR D)
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1)
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Loamy Mucky Mineral (F1)
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]

- ____ 1 cm Muck (A9) (LRR C)
- ____ 2 cm Muck (A10) (LRR B)
- ____ Reduced Vetric (F18)
- ____ Red Parent Materials (TF21)
- ____ Vegetated Sand/Gravel Bars
- ____ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present): Type: _____ Depth (Inches) _____ Hydric Soil? Y / N

Remarks NO hydric soils indicators

Hydrology

Wetland Indicators

Primary Indicators (Any one indicator is sufficient.)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ Saturation (A3)
- ____ Water Marks (B1) (Nonriverine)
- ____ Sediment Deposits (B2) (Nonriverine)
- ____ Drift Deposits (B3) (Nonriverine)
- ____ Surface Soil Cracks (B6)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Water-Stained Leaves (B9)
- ____ Salt Crust (B11)
- ____ Biotic Crust (B12)
- ____ Aquatic Invertebrates (B13)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Plowed Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ____ Water Marks (B1) (Riverine)
- ____ Sediment Deposits (B2) (Riverine)
- ____ Drift Deposits (B3) (Riverine)
- ____ Drainage Patterns (B10)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Shallow Aquitard (D3)
- ____ FAC-Neutral Test (D5)

Field Observations

Surface Water Present? Yes ____ No — Depth (inches) — Wetland Hydrology? Y (N)

Water Table Present? Yes ____ No — Depth (inches) —

Saturation Present? Yes ____ No — Depth (inches) — *(includes capillary fringe)*

Describe Recorded Data (stream gauge, monitoring well, aerial photos, and previous inspections), if available:

Remarks NO hydrology

Stantec

Wetland Determination Data Form–Arid West Region

Data Point: 55
Feature Type: NW51 - suspect area

Project/Site: Pacheco Reservoir Project City/County: Santa Clara County Date: 5/8/20
Applicant/Owner: SCVWD State: CA
Investigator(s): Bc, Se Section, Township, Range unsectioned, 10S, 6E
Landform (hillslope, terrace, etc.) floodplain Local relief (concave, convex, none) concave Slope % 3
Subregion (LRR): C Lat: 37.0392 Long: -121.2915 Datum: NAD83
Soil Map Unit Name: Riverwash NWI Classification: none
Are climatic/hydrologic conditions on the site typical for this time of year? ☑/☐ *(If no, explain in Remarks.)*
Are vegetation ☐/☒ soil ☐/☒ or hydrology ☐/☒ significantly disturbed? Are normal circumstances present? ☑/☐
Are vegetation ☐/☒ soil ☐/☒ or hydrology ☐/☒ naturally problematic? *(If needed, explain in Remarks.)*

Note: On this e-form, the checkmark (left choice) means yes, the X (right choice) means no.

Summary of Findings (Attach site map showing sampling point locations, transects, important features, etc.)

Hydrophytic vegetation? ☐ ☒ Hydric soil? ☐/☒ Wetland hydrology? ☐ ☒ Is sampled area a wetland? Y ☐ N ☒ Other waters? ☐/☒

Evaluation of features designated "Other Waters of the United States"

Indicators: Defined bed and bank ____ Scour ____ Ordinary High Water Mark Mapped ____ Stream Width ____
Feature Designation: Perennial ____ Intermittent ____ Ephemeral ____ Blue-line on USGS Quad ____ Substrate ____
Natural Drainage ____ Artificial Drainage ____ Navigable Water ____

Remarks Suspect woody riparian zone confirmed as nonwetland and acts as upland pair point to RW3.

Vegetation (Use Scientific Names)

Tree Stratum (Plot Size: 30 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Platanus racemosa	33	Yes	FAC
2. Quercus agrifolia	60	Yes	UPL
3.			
4.			
50%= 46.5 20%= 18.6 Total Cover:	93		
Sapling/Shrub Stratum (Plot:____)	**% Cover**	**Species?**	**Status**
1.			
2.			
3.			
4.			
50%=____ 20%=____ Total Cover:	0		
Herb Stratum (Plot Size:____)	**% Cover**	**Species?**	**Status**
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
50%=____ 20%=____ Total Cover:	0		
Woody/Vine Stratum (Plot:____)	**% Cover**	**Species?**	**Status**
1.			
2.			
50%=____ 20%=____ Total Cover:	0		

% Bare Ground in Herb Stratum 100 **%** **Cover of Biotic Crust** ____

Dominance Test Worksheet

Number of dominant species that are OBL, FACW, or FAC: 1 (A)

Total number of dominant species across all strata: 2 (B)

Percent of dominant species that are OBL, FACW, or FAC: 50 (AB)

Prevalence Index Worksheet

Total % Cover of:		Multiply by	
OBL Species	____	x 1 =	0
FACW Species	____	x 2 =	0
FAC Species	33	x 3 =	99
FACU Species	____	x 4 =	0
UPL Species	60	x 5 =	300
Column Totals	93 (A)		399 (B)

Prevalence Index = B/A = 4.30

Hydrophytic Vegetation Indicators

____ Dominance Test is >50%
____ Prevalence Index is ≤ 3.0[1]
____ Morphological Adaptations[1] (provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]*Indicators of hydric soil and wetland hydrology must be present.*

Hydrophytic Vegetation? ☐/☒

Remarks

Area not dominated by hydrophytic vegetation.

Data Point 55

Soils

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10 YR 4/3	100					sand	loamy sand with cobbles/gravel

[1]Types: C = Concentration D = Depletion RM = Reduced Matrix [2]Location: PL = Pore Lining M = Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted)

- _____ Histosol (A1)
- _____ Histic Epipedon (A2)
- _____ Black Histic (A3)
- _____ Hydrogen Sulfide (A4)
- _____ Stratified Layers (A5) (LRR C)
- _____ 1 cm Muck (A9) (LRR D)
- _____ Depleted Below Dark Surface (A11)
- _____ Thick Dark Surface (A12)
- _____ Sandy Mucky Mineral (S1)
- _____ Sandy Gleyed Matrix (S4)
- _____ Sandy Redox (S5)
- _____ Stripped Matrix (S6)
- _____ Loamy Mucky Mineral (F1)
- _____ Loamy Gleyed Matrix (F2)
- _____ Depleted Matrix (F3)
- _____ Redox Dark Surface (F6)
- _____ Depleted Dark Surface (F7)
- _____ Redox Depressions (F8)
- _____ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]

- _____ 1 cm Muck (A9) (LRR C)
- _____ 2 cm Muck (A10) (LRR B)
- _____ Reduced Vetric (F18)
- _____ Red Parent Materials (TF21)
- _____ Vegetated Sand/Gravel Bars
- _____ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present): Type: rocks Depth (Inches) 12 Hydric Soil? X

Remarks

hydric soil indicators not observed.

Hydrology

Wetland Indicators

Primary Indicators (Any one indicator is sufficient.)

- _____ Surface Water (A1)
- _____ High Water Table (A2)
- _____ Saturation (A3)
- _____ Water Marks (B1) (Nonriverine)
- _____ Sediment Deposits (B2) (Nonriverine)
- _____ Drift Deposits (B3) (Nonriverine)
- _____ Surface Soil Cracks (B6)
- _____ Inundation Visible on Aerial Imagery (B7)
- _____ Water-Stained Leaves (B9)
- _____ Salt Crust (B11)
- _____ Biotic Crust (B12)
- _____ Aquatic Invertebrates (B13)
- _____ Hydrogen Sulfide Odor (C1)
- _____ Oxidized Rhizospheres (C3)
- _____ Presence of Reduced Iron (C4)
- _____ Recent Iron Reduction in Plowed Soils (C6)
- _____ Thin Muck Surface (C7)
- _____ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- _____ Water Marks (B1) (Riverine)
- _____ Sediment Deposits (B2) (Riverine)
- _____ Drift Deposits (B3) (Riverine)
- _____ Drainage Patterns (B10)
- _____ Dry-Season Water Table (C2)
- _____ Crayfish Burrows (C8)
- _____ Saturation Visible on Aerial Imagery (C9)
- _____ Shallow Aquitard (D3)
- _____ FAC-Neutral Test (D5)

Field Observations

Surface Water Present? Yes _____ No X Depth (inches) _____ Wetland Hydrology? Y / N X

Water Table Present? Yes _____ No X Depth (inches) _____

Saturation Present? Yes _____ No X Depth (inches) _____ *(includes capillary fringe)*

Describe Recorded Data (stream gauge, monitoring well, aerial photos, and previous inspections), if available:

Remarks

Sample point is in 100-year floodplain but does not show evidence of drift deposits or other riparian floodplain indicators.

Stantec

Data Point 100
Feature Type Pacheco Creek side channel

Wetland Determination Data Form–Arid West Region

Project/Site: Pacheco Reservoir Project City/County: Santa Clara County Date: 8/3/19
Applicant/Owner: SCVWD State: CA
Investigator(s): NE, KBI, TH Section, Township, Range 10S, 6E, unsectioned
Landform (hillslope, terrace, etc.) Terrace Local relief (concave, convex, none) concave Slope % 0-1
Subregion (LRR): C Lat: 37.0418 Long: -121.2907 Datum: NAD83
Soil Map Unit Name: Riverwash NWI Classification: None
Are climatic/hydrologic conditions on the site typical for this time of year? (Y) N *(If no, explain in Remarks.)*
Are vegetation Y (N), soil Y / (N) or hydrology Y / (N) significantly disturbed? Are normal circumstances present? (Y) N
Are vegetation Y / (N), soil Y / (N) or hydrology Y / (N) naturally problematic? *(If needed, explain in Remarks.)*

Summary of Findings (Attach site map showing sampling point locations, transects, important features, etc.)
Hydrophytic vegetation? Y / N Hydric soil? Y / N Wetland hydrology? Y / N Is sampled area a wetland? Y / (N) Other waters? (Y) / N

Evaluation of features designated "Other Waters of the United States"
Indicators: Defined bed and bank X Scour X Ordinary High Water Mark Mapped X Stream Width 8ft.
Feature Designation: Perennial ____ Intermittent X Ephemeral ____ Blue-line on USGS Quad ____ Substrate gravel, clay, rock
Natural Drainage X Artificial Drainage ____ Navigable Water ____

Remarks Feature is Northwesternmost arm of Perennial stream which flows east to west along Hwy. 152. OHWM evidenced by bed and bank within defined channel. Indication of active channel as aggradation is evident from silt layer > 2 inches

Vegetation (Use Scientific Names)

Tree Stratum (Plot Size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
50%=____ 20%=____ Total Cover:			
Sapling/Shrub Stratum (Plot:____)	**% Cover**	**Species?**	**Status**
1.			
2.			
3.			
4.			
50%=____ 20%=____ Total Cover:			
Herb Stratum (Plot Size:____)	**% Cover**	**Species?**	**Status**
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
50%=____ 20%=____ Total Cover:			
Woody/Vine Stratum (Plot:____)	**% Cover**	**Species?**	**Status**
1.			
2.			
50%=____ 20%=____ Total Cover:			

% Bare Ground in Herb Stratum ____ **% Cover of Biotic Crust** ____

Dominance Test Worksheet
Number of dominant species that are OBL, FACW, or FAC: ____ (A)
Total number of dominant species across all strata: ____ (B)
Percent of dominant species that are OBL, FACW, or FAC: ____ (AB)

Prevalence Index Worksheet

Total % Cover of:		Multiply by	
OBL Species	____	x 1 =	____
FACW Species	____	x 2 =	____
FAC Species	____	x 3 =	____
FACU Species	____	x 4 =	____
UPL Species	____	x 5 =	____
Column Totals	____ (A)		____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators
____ Dominance Test is >50%
____ Prevalence Index is ≤ 3.0[1]
____ Morphological Adaptations[1] (provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)
[1]*Indicators of hydric soil and wetland hydrology must be present.*

Hydrophytic Vegetation? Y / N

Remarks Pacheco Creek (PS-1) side channel OHWM. DP documents OHWM of side channel. Riparian veg present above OHWM as documented by

Data Point 100

Soils

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

[1]Types: C = Concentration D = Depletion RM = Reduced Matrix [2]Location: PL = Pore Lining M = Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted)

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5) (LRR C)
- ____ 1 cm Muck (A9) (LRR D)
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1)
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Loamy Mucky Mineral (F1)
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]

- ____ 1 cm Muck (A9) (LRR C)
- ____ 2 cm Muck (A10) (LRR B)
- ____ Reduced Vetric (F18)
- ____ Red Parent Materials (TF21)
- ____ Vegetated Sand/Gravel Bars
- ____ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present): Type: _____ Depth (Inches) _____ Hydric Soil? Y / N

Remarks No soils. DP downstream side channel to PS-1.

Hydrology

Wetland Indicators

Primary Indicators (Any one indicator is sufficient.)

- X Surface Water (A1)
- ____ High Water Table (A2)
- ____ Saturation (A3)
- ____ Water Marks (B1) (Nonriverine)
- ____ Sediment Deposits (B2) (Nonriverine)
- ____ Drift Deposits (B3) (Nonriverine)
- ____ Surface Soil Cracks (B6)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Water-Stained Leaves (B9)
- ____ Salt Crust (B11)
- ____ Biotic Crust (B12)
- ____ Aquatic Invertebrates (B13)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Plowed Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ____ Water Marks (B1) (Riverine)
- X Sediment Deposits (B2) (Riverine)
- X Drift Deposits (B3) (Riverine)
- ____ Drainage Patterns (B10)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Shallow Aquitard (D3)
- ____ FAC-Neutral Test (D5)

Field Observations

Surface Water Present? Yes X No ____ Depth (inches) 6 inches Wetland Hydrology? (Y) / N

Water Table Present? Yes ____ No ____ Depth (inches) _____

Saturation Present? Yes ____ No ____ Depth (inches) _____ *(includes capillary fringe)*

Describe Recorded Data (stream gauge, monitoring well, aerial photos, and previous inspections), if available:

Remarks Surface water present. OHWM indicated by scour, deposition, sediment sorting and drift deposits.

Stantec

RW-5

Wetland Determination Data Form–Arid West Region

Data Point: 101
Feature Type: Riparian wetland

Project/Site: Pacheco Rese City/County: Santa Clara Date: 8/8/19
Applicant/Owner: SCVWD State: CA
Investigator(s): NE, TH, LM Section, Township, Range: 10S, 6E, unsectioned
Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope %: 2
Subregion (LRR): C Lat: 37.0420 Long: -121.2906 Datum: NAD83
Soil Map Unit Name: Riverwash NWI Classification: None

Are climatic/hydrologic conditions on the site typical for this time of year? (Y) / N *(If no, explain in Remarks.)*
Are vegetation Y / (N) soil Y / (N) or hydrology Y / (N) significantly disturbed? Are normal circumstances present? (Y) / N
Are vegetation Y / (N) soil Y / (N) or hydrology Y / (N) naturally problematic? *(If needed, explain in Remarks.)*

Summary of Findings (Attach site map showing sampling point locations, transects, important features, etc.)
Hydrophytic vegetation? (Y) / N Hydric soil? (Y) / N Wetland hydrology? (Y) / N Is sampled area a wetland? (Y) / N Other waters? Y / (N)

Evaluation of features designated "Other Waters of the United States"
Indicators: Defined bed and bank ____ Scour ____ Ordinary High Water Mark Mapped ____ Stream Width ____
Feature Designation: Perennial ____ Intermittent ____ Ephemeral ____ Blue-line on USGS Quad ____ Substrate ____
Natural Drainage ____ Artificial Drainage ____ Navigable Water ____

Remarks Sample point documents riparian wetland representative of northwesternmost stream channel above and below OHWM.

Vegetation (Use Scientific Names)

Tree Stratum (Plot Size: 10x10)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix lasiolepis	60	Y	FACW
2.			
3.			
4.			
50%= 30 20%= 12 Total Cover:	60		

Sapling/Shrub Stratum (Plot: ____)	% Cover	Species?	Status
1.			
2.			
3.			
4.			
50%= ____ 20%= ____ Total Cover:			

Herb Stratum (Plot Size: 10x10)	% Cover	Species?	Status
1. Presicaria punctata	30	Y	OBL
2. Mentha pulegium	12	Y	OBL
3. Polypogon monspeliensis	8	N	FACW
4. Rumex crispus	5	N	FAC
5.			
6.			
7.			
8.			
50%= 27.5 20%= 11 Total Cover:	55		

Woody/Vine Stratum (Plot: ____)	% Cover	Species?	Status
1.			
2.			
50%= ____ 20%= ____ Total Cover:			

% Bare Ground in Herb Stratum 45 **% Cover of Biotic Crust** ____

Dominance Test Worksheet
Number of dominant species that are OBL, FACW, or FAC: 3 (A)
Total number of dominant species across all strata: 3 (B)
Percent of dominant species that are OBL, FACW, or FAC: 100 (AB)

Prevalence Index Worksheet

Total % Cover of:		Multiply by
OBL Species	____	x 1 = ____
FACW Species	____	x 2 = ____
FAC Species	____	x 3 = ____
FACU Species	____	x 4 = ____
UPL Species	____	x 5 = ____
Column Totals	____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators
X Dominance Test is >50%
____ Prevalence Index is ≤ 3.0[1]
____ Morphological Adaptations[1] (provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)
[1]*Indicators of hydric soil and wetland hydrology must be present.*

Hydrophytic Vegetation? (Y) / N

Remarks Sample contains a dominance of hydrophytic vegetation; meets both dominance and prevalence test

Data Point 101

Soils

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 2/1	100						Silty clay loam

[1]Types: C = Concentration D = Depletion RM = Reduced Matrix [2]Location: PL = Pore Lining M = Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted)

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5) (LRR C)
- ____ 1 cm Muck (A9) (LRR D)
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1)
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Loamy Mucky Mineral (F1)
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]

- ____ 1 cm Muck (A9) (LRR C)
- ____ 2 cm Muck (A10) (LRR B)
- ____ Reduced Vetric (F18)
- ____ Red Parent Materials (TF21)
- ____ Vegetated Sand/Gravel Bars
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present): Type: _____ Depth (Inches) _____ Hydric Soil? (Y) N

Remarks Wetland subject to frequent flooding where Redox is often lacking; soils hydric

Hydrology

Wetland Indicators

Primary Indicators (Any one indicator is sufficient.)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ____ Water Marks (B1) (Nonriverine)
- ____ Sediment Deposits (B2) (Nonriverine)
- ____ Drift Deposits (B3) (Nonriverine)
- ____ Surface Soil Cracks (B6)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Water-Stained Leaves (B9)
- ____ Salt Crust (B11)
- ____ Biotic Crust (B12)
- ____ Aquatic Invertebrates (B13)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Plowed Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- X Water Marks (B1) (Riverine)
- X Sediment Deposits (B2) (Riverine)
- X Drift Deposits (B3) (Riverine)
- ____ Drainage Patterns (B10)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Shallow Aquitard (D3)
- X FAC-Neutral Test (D5)

Field Observations

Surface Water Present? Yes X No ____ Depth (inches) ____ Wetland Hydrology? (Y) N

Water Table Present? Yes X No ____ Depth (inches) 0 (surface)

Saturation Present? Yes X No ____ Depth (inches) 0 (surface) *(includes capillary fringe)*

Describe Recorded Data (stream gauge, monitoring well, aerial photos, and previous inspections), if available:

Remarks Hydrology indicated by surface water & saturation w/in feature.

Stantec

upland pair to DP 101 (RW-5)

Data Point 402
Feature Type U-5

Wetland Determination Data Form–Arid West Region

Project/Site: Pechanga Reservoir City/County: Santa Clara County. Date: 8/2/19
Applicant/Owner: SCVWD State: CA
Investigator(s): NE, TF, LM Section, Township, Range 10S, 6E, unsectioned
Landform (hillslope, terrace, etc.) Terrace Local relief (concave, convex, none) Concave Slope % 2
Subregion (LRR): C Lat: 37.0420 Long: -121.7906 Datum: NAD83
Soil Map Unit Name: River Wash NWI Classification: None
Are climatic/hydrologic conditions on the site typical for this time of year? (Y) N *(If no, explain in Remarks.)*
Are vegetation Y / (N), soil Y / (N) or hydrology Y / (N) significantly disturbed? Are normal circumstances present? (Y) / N
Are vegetation Y / (N), soil Y / (N) or hydrology Y / (N) naturally problematic? *(If needed, explain in Remarks.)*

Summary of Findings (Attach site map showing sampling point locations, transects, important features, etc.)
Hydrophytic vegetation? Y / (N) Hydric soil? Y / (N) Wetland hydrology? Y / (N) Is sampled area a wetland? Y / (N) Other waters? Y / (N)

Evaluation of features designated "Other Waters of the United States"
Indicators: Defined bed and bank ____ Scour ____ Ordinary High Water Mark Mapped ____ Stream Width ____
Feature Designation: Perennial ____ Intermittent ____ Ephemeral ____ Blue-line on USGS Quad ____ Substrate ____
Natural Drainage ____ Artificial Drainage ____ Navigable Water ____

Remarks Sample point documents upland pair to DP-101. Area lacks hydrophytic veg, soils, & hydrology.

Vegetation (Use Scientific Names)

Tree Stratum (Plot Size: 10x10)	Absolute % Cover	Dominant Species?	Indicator Status
1. Platanus racemosa	60		FAC
2.			
3.			
4.			
50%=____ 20%=____ Total Cover:	60		

Sapling/Shrub Stratum (Plot:____)	% Cover	Species?	Status
1.			
2.			
3.			
4.			
50%=____ 20%=____ Total Cover:			

Herb Stratum (Plot Size:____)	% Cover	Species?	Status
1. Cardus Pycnocephalus	9	Y	NL
2. Turilis arvensis	3	Y	NL
3. Centromadia sp.	1	N	?
4.			
5.			
6.			
7.			
8.			
50%=6 20%=2.4 Total Cover:	12		

Woody/Vine Stratum (Plot:____)	% Cover	Species?	Status
1.			
2.			
50%=____ 20%=____ Total Cover:			

% Bare Ground in Herb Stratum 80 **% Cover of Biotic Crust** ____

Dominance Test Worksheet
Number of dominant species that are OBL, FACW, or FAC: 1 (A)
Total number of dominant species across all strata: 3 (B)
Percent of dominant species that are OBL, FACW, or FAC: 33% (AB)

Prevalence Index Worksheet

Total % Cover of:		Multiply by
OBL Species	____	x 1 = ____
FACW Species	____	x 2 = ____
FAC Species	____	x 3 = ____
FACU Species	____	x 4 = ____
UPL Species	____	x 5 = ____
Column Totals	____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators
____ Dominance Test is >50%
____ Prevalence Index is ≤ 3.0[1]
____ Morphological Adaptations[1] (provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation? Y (N)

Remarks SAND / Gravel bar is sparsely vegetated; acts as floodplain between two dendritic arms of stream

Data Point 102

Soils

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

[1]Types: C = Concentration D = Depletion RM = Reduced Matrix [2]Location: PL = Pore Lining M = Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted)

- _____ Histosol (A1)
- _____ Histic Epipedon (A2)
- _____ Black Histic (A3)
- _____ Hydrogen Sulfide (A4)
- _____ Stratified Layers (A5) (LRR C)
- _____ 1 cm Muck (A9) (LRR D)
- _____ Depleted Below Dark Surface (A11)
- _____ Thick Dark Surface (A12)
- _____ Sandy Mucky Mineral (S1)
- _____ Sandy Gleyed Matrix (S4)
- _____ Sandy Redox (S5)
- _____ Stripped Matrix (S6)
- _____ Loamy Mucky Mineral (F1)
- _____ Loamy Gleyed Matrix (F2)
- _____ Depleted Matrix (F3)
- _____ Redox Dark Surface (F6)
- _____ Depleted Dark Surface (F7)
- _____ Redox Depressions (F8)
- _____ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]

- _____ 1 cm Muck (A9) (LRR C)
- _____ 2 cm Muck (A10) (LRR B)
- _____ Reduced Vetric (F18)
- _____ Red Parent Materials (TF21)
- X Vegetated Sand/Gravel Bars
- _____ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present): Type: Rock Depth (Inches) 0 Hydric Soil? Y / (N)

Remarks Shovel Refusal at surface of sand/gravel bar.

Hydrology

Wetland Indicators

Primary Indicators (Any one indicator is sufficient.)

- _____ Surface Water (A1)
- _____ High Water Table (A2)
- _____ Saturation (A3)
- _____ Water Marks (B1) (Nonriverine)
- _____ Sediment Deposits (B2) (Nonriverine)
- _____ Drift Deposits (B3) (Nonriverine)
- _____ Surface Soil Cracks (B6)
- _____ Inundation Visible on Aerial Imagery (B7)
- _____ Water-Stained Leaves (B9)
- _____ Salt Crust (B11)
- _____ Biotic Crust (B12)
- _____ Aquatic Invertebrates (B13)
- _____ Hydrogen Sulfide Odor (C1)
- _____ Oxidized Rhizospheres (C3)
- _____ Presence of Reduced Iron (C4)
- _____ Recent Iron Reduction in Plowed Soils (C6)
- _____ Thin Muck Surface (C7)
- _____ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- _____ Water Marks (B1) (Riverine)
- _____ Sediment Deposits (B2) (Riverine)
- _____ Drift Deposits (B3) (Riverine)
- _____ Drainage Patterns (B10)
- _____ Dry-Season Water Table (C2)
- _____ Crayfish Burrows (C8)
- _____ Saturation Visible on Aerial Imagery (C9)
- _____ Shallow Aquitard (D3)
- _____ FAC-Neutral Test (D5)

Field Observations

Surface Water Present? Yes _____ No X Depth (inches) _____ Wetland Hydrology? Y / (N)

Water Table Present? Yes _____ No X Depth (inches) _____

Saturation Present? Yes _____ No X Depth (inches) _____ *(includes capillary fringe)*

Describe Recorded Data (stream gauge, monitoring well, aerial photos, and previous inspections), if available:

Remarks No hydrology

Stantec

EW-6

Data Point 205
Feature Type Riparian Wetland

Wetland Determination Data Form–Arid West Region

Project/Site: Pacheco Reservoir Project City/County: Santa Clara County Date: 8/9/14
Applicant/Owner: SCVWD State: CA
Investigator(s): NE, TH, LM Section, Township, Range 10S, 6E, unsectioned
Landform (hillslope, terrace, etc.) terrace Local relief (concave, convex, none) concave Slope % 2
Subregion (LRR): C Lat: 37.0375 Long: -121.2936 Datum: NAD 83
Soil Map Unit Name: Riverwash NWI Classification: none
Are climatic/hydrologic conditions on the site typical for this time of year? (Y) N *(If no, explain in Remarks.)*
Are vegetation Y /(N), soil Y /(N) or hydrology Y /(N) significantly disturbed? Are normal circumstances present? (Y) / N
Are vegetation Y /(N), soil Y /(N) or hydrology Y /(N) naturally problematic? *(If needed, explain in Remarks.)*

Summary of Findings (Attach site map showing sampling point locations, transects, important features, etc.)
Hydrophytic vegetation? (Y) N Hydric soil? Y /(N) Wetland hydrology? Y /(N) Is sampled area a wetland? (Y) N Other waters? Y /(N)

Evaluation of features designated "Other Waters of the United States"
Indicators: Defined bed and bank ____ Scour ____ Ordinary High Water Mark Mapped ____ Stream Width ____
Feature Designation: Perennial ____ Intermittent ____ Ephemeral ____ Blue-line on USGS Quad ____ Substrate ____
Natural Drainage ____ Artificial Drainage ____ Navigable Water ____

Remarks Sample documents stringer herbaceous riparian along the bank of the perennial stream situated above the ordinary (PS-1)

Vegetation (Use Scientific Names)

Tree Stratum (Plot Size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
50%=____ 20%=____ Total Cover:			
Sapling/Shrub Stratum (Plot:____)	**% Cover**	**Species?**	**Status**
1.			
2.			
3.			
4.			
50%=____ 20%=____ Total Cover:			
Herb Stratum (Plot Size: 1m²)	**% Cover**	**Species?**	**Status**
1. Paspalum distichum	60	Y	FACW
2. Cynodon dactylon	30	Y	FACU
3. Eleocharis acicularis	5	N	OBL
4. Cyperus eragrostis	2	N	FACW
5.			
6.			
7.			
8.			
50%=48.5 20%=19.4 Total Cover: 97			
Woody/Vine Stratum (Plot:____)	**% Cover**	**Species?**	**Status**
1.			
2.			
50%=____ 20%=____ Total Cover:			

% Bare Ground in Herb Stratum 3 **% Cover of Biotic Crust** ____

Dominance Test Worksheet
Number of dominant species that are OBL, FACW, or FAC: 1 (A)
Total number of dominant species across all strata: 2 (B)
Percent of dominant species that are OBL, FACW, or FAC: 50 (AB)

Prevalence Index Worksheet

Total % Cover of:		Multiply by	
OBL Species	5	x 1 =	5
FACW Species	62	x 2 =	124
FAC Species	____	x 3 =	____
FACU Species	30	x 4 =	120
UPL Species	____	x 5 =	____
Column Totals	97 (A)		249 (B)

Prevalence Index = B/A = 2.57

Hydrophytic Vegetation Indicators
____ Dominance Test is >50%
X Prevalence Index is ≤ 3.0[1]
____ Morphological Adaptations[1] (provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation? (Y) N

Remarks Meets wetland veg criteria as shown by prevalence index

Data Point 200

Soils

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10yr 3/1	95	5YR 4/6	5	C	M	Silty Clay loam	
4-12	7.5yr 4/1	70	5YR 4/6	60	C	M	clay loam	gravels throughout
12+	10yr 3/1	20						

[1]Types: C = Concentration D = Depletion RM = Reduced Matrix [2]Location: PL = Pore Lining M = Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted)

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5) (LRR C)
- ____ 1 cm Muck (A9) (LRR D)
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1)
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Loamy Mucky Mineral (F1)
- ____ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]

- ____ 1 cm Muck (A9) (LRR C)
- ____ 2 cm Muck (A10) (LRR B)
- ____ Reduced Vetric (F18)
- ____ Red Parent Materials (TF21)
- ____ Vegetated Sand/Gravel Bars
- ____ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present): Type: Rock Depth (Inches) 12 Hydric Soil? Y / N

Remarks At least 5% redox in the upper 6 inches of a depleted mineral soil layer indicates hydric soils

Hydrology

Wetland Indicators

Primary Indicators (Any one indicator is sufficient.)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- X Saturation (A3)
- ____ Water Marks (B1) (Nonriverine)
- ____ Sediment Deposits (B2) (Nonriverine)
- ____ Drift Deposits (B3) (Nonriverine)
- ____ Surface Soil Cracks (B6)
- X Inundation Visible on Aerial Imagery (B7)
- ____ Water-Stained Leaves (B9)
- ____ Salt Crust (B11)
- ____ Biotic Crust (B12)
- ____ Aquatic Invertebrates (B13)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Plowed Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ____ Water Marks (B1) (Riverine)
- X Sediment Deposits (B2) (Riverine)
- X Drift Deposits (B3) (Riverine)
- X Drainage Patterns (B10)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Shallow Aquitard (D3)
- ____ FAC-Neutral Test (D5)

Field Observations

Surface Water Present? Yes ____ No X Depth (inches) ____ Wetland Hydrology? Y / N

Water Table Present? Yes ____ No X Depth (inches) ____

Saturation Present? Yes X No ____ Depth (inches) 8 inches (includes capillary fringe)

Describe Recorded Data (stream gauge, monitoring well, aerial photos, and previous inspections), if available:

Remarks Hydrology indicated by saturation & inundation on imagry. Secondary indicators also present.

Stantec

Upland pair to DP200 (RW-6)

Wetland Determination Data Form–Arid West Region

Data Point 201
Feature Type U-6

Project/Site: Pacheco Reservoir Project City/County: Santa Clara County Date: 6/9/19
Applicant/Owner: SCVWD State: CA
Investigator(s): NF, TH, LM Section, Township, Range 10S, 6E, unsectioned
Landform (hillslope, terrace, etc.) Hillside Local relief (concave, convex, none) Convex Slope % 4
Subregion (LRR): C Lat: 37.0375 Long: -121.2936 Datum: NAD 83
Soil Map Unit Name: Riverwash NWI Classification: None

Are climatic/hydrologic conditions on the site typical for this time of year? Y / N *(If no, explain in Remarks.)*
Are vegetation Y / (N), soil Y / (N), or hydrology Y / (N) significantly disturbed? Are normal circumstances present? (Y) / N
Are vegetation Y / (N), soil Y / (N) or hydrology Y / (N) naturally problematic? *(If needed, explain in Remarks.)*

Summary of Findings (Attach site map showing sampling point locations, transects, important features, etc.)
Hydrophytic vegetation? Y / (N) Hydric soil? Y / (N) Wetland hydrology? Y / (N) Is sampled area a wetland? Y / (N) Other waters? Y / (N)

Evaluation of features designated "Other Waters of the United States"
Indicators: Defined bed and bank ____ Scour ____ Ordinary High Water Mark Mapped ____ Stream Width ____
Feature Designation: Perennial ____ Intermittent ____ Ephemeral ____ Blue-line on USGS Quad ____ Substrate ____
Natural Drainage ____ Artificial Drainage ____ Navigable Water ____

Remarks Sample point documents upland pair to DP-200. Hydrophytic veg, soils, & hydrology are absent from this location.

Vegetation (Use Scientific Names)

Tree Stratum (Plot Size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
50%=____ 20%=____ Total Cover:			
Sapling/Shrub Stratum (Plot:____)	**% Cover**	**Species?**	**Status**
1.			
2.			
3.			
4.			
50%=____ 20%=____ Total Cover:			
Herb Stratum (Plot Size:____)	**% Cover**	**Species?**	**Status**
1. Cynodon dactylon	95	Y	FACU
2. Paspalum distichum	5	N	FACW
3. Brittchia graveolens	3	N	NL
4. Polypogon monspeliensis	2	N	FACW
5.			
6.			
7.			
8.			
50%=50 20%=20 Total Cover:	100		
Woody/Vine Stratum (Plot:____)	**% Cover**	**Species?**	**Status**
1.			
2.			
50%=____ 20%=____ Total Cover:			

% Bare Ground in Herb Stratum 0 **% Cover of Biotic Crust** ____

Dominance Test Worksheet
Number of dominant species that are OBL, FACW, or FAC: 0 (A)
Total number of dominant species across all strata: 1 (B)
Percent of dominant species that are OBL, FACW, or FAC: 0 (AB)

Prevalence Index Worksheet

Total % Cover of:		Multiply by	
OBL Species	____	x 1 =	____
FACW Species	____	x 2 =	____
FAC Species	____	x 3 =	____
FACU Species	____	x 4 =	____
UPL Species	____	x 5 =	____
Column Totals	____ (A)		____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators
____ Dominance Test is >50%
____ Prevalence Index is ≤ 3.0[1]
____ Morphological Adaptations[1] (provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)
[1]*Indicators of hydric soil and wetland hydrology must be present.*

Hydrophytic Vegetation? Y / (N)

Remarks

Data Point 201

Soils

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR, 2/2	100					sandy clay.	

[1]Types: C = Concentration D = Depletion RM = Reduced Matrix [2]Location: PL = Pore Lining M = Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted)

- _____ Histosol (A1)
- _____ Histic Epipedon (A2)
- _____ Black Histic (A3)
- _____ Hydrogen Sulfide (A4)
- _____ Stratified Layers (A5) (LRR C)
- _____ 1 cm Muck (A9) (LRR D)
- _____ Depleted Below Dark Surface (A11)
- _____ Thick Dark Surface (A12)
- _____ Sandy Mucky Mineral (S1)
- _____ Sandy Gleyed Matrix (S4)
- _____ Sandy Redox (S5)
- _____ Stripped Matrix (S6)
- _____ Loamy Mucky Mineral (F1)
- _____ Loamy Gleyed Matrix (F2)
- _____ Depleted Matrix (F3)
- _____ Redox Dark Surface (F6)
- _____ Depleted Dark Surface (F7)
- _____ Redox Depressions (F8)
- _____ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]

- _____ 1 cm Muck (A9) (LRR C)
- _____ 2 cm Muck (A10) (LRR B)
- _____ Reduced Vetric (F18)
- _____ Red Parent Materials (TF21)
- _____ Vegetated Sand/Gravel Bars
- _____ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present): Type: Cobble Depth (Inches) 6 Hydric Soil? Y / (N)

Remarks Hydric soil indicators not observed

Hydrology

Wetland Indicators

Primary Indicators (Any one indicator is sufficient.)

- _____ Surface Water (A1)
- _____ High Water Table (A2)
- _____ Saturation (A3)
- _____ Water Marks (B1) (Nonriverine)
- _____ Sediment Deposits (B2) (Nonriverine)
- _____ Drift Deposits (B3) (Nonriverine)
- _____ Surface Soil Cracks (B6)
- _____ Inundation Visible on Aerial Imagery (B7)
- _____ Water-Stained Leaves (B9)
- _____ Salt Crust (B11)
- _____ Biotic Crust (B12)
- _____ Aquatic Invertebrates (B13)
- _____ Hydrogen Sulfide Odor (C1)
- _____ Oxidized Rhizospheres (C3)
- _____ Presence of Reduced Iron (C4)
- _____ Recent Iron Reduction in Plowed Soils (C6)
- _____ Thin Muck Surface (C7)
- _____ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- _____ Water Marks (B1) (Riverine)
- _____ Sediment Deposits (B2) (Riverine)
- _____ Drift Deposits (B3) (Riverine)
- _____ Drainage Patterns (B10)
- _____ Dry-Season Water Table (C2)
- _____ Crayfish Burrows (C8)
- _____ Saturation Visible on Aerial Imagery (C9)
- _____ Shallow Aquitard (D3)
- _____ FAC-Neutral Test (D5)

Field Observations

Surface Water Present? Yes ____ No X Depth (inches) _____ Wetland Hydrology? Y / (N)

Water Table Present? Yes ____ No X Depth (inches) _____

Saturation Present? Yes ____ No X Depth (inches) _____ *(includes capillary fringe)*

Describe Recorded Data (stream gauge, monitoring well, aerial photos, and previous inspections), if available:

Remarks wetland hydrology indicators not observed.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Pacheco Reservoir Expansion Project City/County: Santa Clara County Sampling Date: 12/2/19

Applicant/Owner: Santa Clara Valley Water District State: CA Sampling Point: 50003W

Investigator(s): T. Beyerl, S. Hickey Section, Township, Range: _____

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): Concave Slope (%): 5

Subregion (LRR): LRR C: 15 - Central Coast Range Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Valecitos loam, 30-75% slopes, eroded NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	Is the Sampled Area within a Wetland? Yes ✓ No ____
Hydric Soil Present?	Yes ✓	No ____	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks: Riparian corridor, Pacheco creek active floodplain

Ripol

VEGETATION – Use scientific names of plants.

Malech property

Tree Stratum (Plot size: 50x20)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix laevigata	10	Y	FACW
2. Platanus racemosa	5	Y	FAC
3. Quercus lobata	1	N	FACU
4. Salix lasiolepis	4	Y	FAW
	20	= Total Cover	

Sapling/Shrub Stratum (Plot size: 50x20)	Absolute % Cover	Dominant Species?	Indicator Status
1. Baccharis salicifolia	15	Y	FAC
2. Quercus agrifolia	1	N	NL
3. Eriogonum fascicularis	3	N	NL
4. Baccharis pilularis	2	N	NL
5. Artemisia californica	1	N	NL
	22	= Total Cover	

Herb Stratum (Plot size: 50x20)	Absolute % Cover	Dominant Species?	Indicator Status
1. Juncus balticus	8	Y	FACW
2. Cynodon dactylon	5	Y	FACU
3. Foeniculum vulgare	8	Y	NL
4. Juncus patens	2	N	FACW
5. Dipsacus fullonum	2	N	FAC
6. Brassica nigra	5	Y	NL
7. Dittrichia graveolens	4	N	NL
8. Bromus diandrus	3	N	NL
other 3%	40	= Total Cover	

Woody Vine Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
	—	= Total Cover	

% Bare Ground in Herb Stratum 60 % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 63 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks:

SOIL

Sampling Point: 5000-W

Profile Description: (Describe to the depth needed to document the Indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
	2.5Y 5/1	75	2.5Y 4/4	25	C	M	Sandy clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ✓ Sediment Deposits (B2) (**Nonriverine**)
- ✓ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No ____ Depth (inches): ____

Water Table Present? Yes ✓ No ____ Depth (inches): 6

Saturation Present? (includes capillary fringe) Yes ____ No ____ Depth (inches): ____

Wetland Hydrology Present? Yes ✓ No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Pacheco Reservoir Expansion Project City/County: Santa Clara County Sampling Date: 12/2/19

Applicant/Owner: Santa Clara Valley Water District State: CA Sampling Point: 5000-UPL

Investigator(s): T. Beyerl, S. Hickey Section, Township, Range:

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): convex Slope (%): 40

Subregion (LRR): LRR C: 15 - Central Coast Range Lat: Long: Datum:

Soil Map Unit Name: Valeciteslloam, 30-75% slopes, eroded NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No (If no, explain in Remarks.)

Are Vegetation No, Soil Yes, or Hydrology No significantly disturbed? Fill Are "Normal Circumstances" present? Yes ✓ No

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes No ✓

Hydric Soil Present? Yes ✓ No

Wetland Hydrology Present? Yes No ✓

Is the Sampled Area within a Wetland? Yes No ✓

Remarks: Pa.red point to Rip 01

Rip01up Coastal scrub - transitional from willow riparian

VEGETATION – Use scientific names of plants.

Malech property

Tree Stratum (Plot size: 50x20)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix laevigata	2	N	FACW
2.			
3.			
4.			
	2 = Total Cover		
Sapling/Shrub Stratum (Plot size: 50x20)			
1. Eriogonum fasciculatum	50	Y	NL
2. Artemisia californica	5	N	FAC
3.			
4.			
5.			
	55 = Total Cover		
Herb Stratum (Plot size: 50x20)			
1. Brassica nigra	14	Y	NL
2. Foeniculum vulgare	1	N	NL
3.			
4.			
5.			
6.			
7.			
8.			
	15 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 85 % Cover of Biotic Crust

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 0	x 1 = 0
FACW species 2	x 2 = 4
FAC species 5	x 3 = 15
FACU species 0	x 4 = 0
UPL species 65	x 5 = 325
Column Totals: 72 (A)	(B)

Prevalence Index = B/A = 4.7

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No ✓

Remarks:

SOIL

Sampling Point: 5000+UPL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 2/2	100					gravelly loam	fill
4-16	2.5Y 4/2	75	7.5YR 4/4	25	C	M	sandy clay loam, gravelly	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ___ No ✓ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): ___

Wetland Hydrology Present? Yes ___ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Pacheco Reservoir Expansion Project City/County: Santa Clara County Sampling Date: 12/12/19

Applicant/Owner: Santa Clara Valley Water District State: CA Sampling Point: 6020-UPL

Investigator(s): SH PB Section, Township, Range:

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): Ø

Subregion (LRR): LRR C: 15 - Central CA Coast Range Lat: Long: Datum:

Soil Map Unit Name: Garretson loam, gravel substratum, 0-2% slopes NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? No Are "Normal Circumstances" present? Yes ✓ No

Are Vegetation N, Soil N, or Hydrology N naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No ✓	**Is the Sampled Area within a Wetland?** Yes No ✓
Hydric Soil Present?	Yes ✓	No	
Wetland Hydrology Present?	Yes	No ✓	

Remarks: Upland point for flashy seasonal wetland

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 10 x 10')			
1. Centaurea solstitialis	30	Y	NL
2. Avena barbata	30	Y	NL
3. Erodium botrys	7	N	FACU
4. Plantago lanceolatum	12	N	FAC
5. Medicago polymorpha	8	N	UPL
6. Gnaphalium canescens	2	N	FACW
7.			
8.			
	89 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 10 % Cover of Biotic Crust

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- Dominance Test is >50%
- Prevalence Index is ≤3.0[1]
- Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No ✓

Remarks:

SOIL

Sampling Point: 6020-VPL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 3/3	100					clay loam	
1-5	Gley 1 4/N	100					loamy clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ✓ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: gravel / rock

Depth (inches): 5

Hydric Soil Present? Yes ✓ No ___

Remarks:

lots of gravel & rock in the soil

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ___ No ✓ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): ___

Wetland Hydrology Present? Yes ___ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Pacheco Reservoir Expansion Project City/County: Santa Clara County Sampling Date 1/30/20

Applicant/Owner: Santa Clara Valley Water District State: CA Sampling Point FTOOE-W

Investigator(s): Shannon Hickey & Hayley Rundle Section, Township, Range:

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): convex Slope (%) 1

Subregion (LRR): LRR C: 15 - Central Coast Range Lat: Long: Datum:

Soil Map Unit Name: Pleasanton gravelly loam, 9-15% slopes NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? No Are "Normal Circumstances" present? Yes X No

Are Vegetation N, Soil N, or Hydrology N naturally problematic? No (If needed explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No	Is the Sampled Area within a Wetland? Yes ✓ No
Hydric Soil Present?	Yes ✓	No	
Wetland Hydrology Present?	Yes ✓	No	

Remarks:

Riparian forest on flood terrace of Pacheco Creek; currently inundated and saturated

VEGETATION – Use scientific names of plants.

D.in Property

Tree Stratum (Plot size: 50x20)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix laevegata	15	Y	FACW
2. Platanus racemosa	10	Y	FAC
3. Salix lasiolepis	5	N	FACW
4. Umbellularia californica	5	N	FAC
	35	= Total Cover	

Sapling/Shrub Stratum (Plot size:)			
1. Quercus agrifolia var agrifolia	2	Y	NL
2. Toxicodendron diversilobum	1	N	FACU
3. Salix laevegata	5	Y	FACW
4.			
5.			
	8	= Total Cover	

Herb Stratum (Plot size: 50x20)			
1. Stachys pycnantha	30	Y	FACW
2. Polypogon monspeliensis	2	N	FACW
3. Rumex salicifolius	5	N	FACW
4. Unk. forbs + grasses	1	N	
5.			
6.			
7.			
8.			
	38	= Total Cover	

Woody Vine Stratum (Plot size:)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 10 % Cover of ~~Biotic Crust~~ water 50

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No

Remarks:

Riparian forested wetland adjacent to Pacheco Creek

SOIL

Sampling Point: 7003-W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 2/1	100					loamy sand	No distinct mottling or gley

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (LRR C)
- __ 1 cm Muck (A9) (LRR D)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1) ?
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- ✓ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (LRR C)
- __ 2 cm Muck (A10) (LRR B)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- X Surface Water (A1)
- __ High Water Table (A2)
- X Saturation (A3)
- __ Water Marks (B1) (Nonriverine)
- __ Sediment Deposits (B2) (Nonriverine)
- __ Drift Deposits (B3) (Nonriverine)
- __ Surface Soil Cracks (B6)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Biotic Crust (B12)
- __ Aquatic Invertebrates (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Oxidized Rhizospheres along Living Roots (C3)
- __ Presence of Reduced Iron (C4)
- __ Recent Iron Reduction in Tilled Soils (C6)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- __ Water Marks (B1) (Riverine)
- __ Sediment Deposits (B2) (Riverine)
- __ Drift Deposits (B3) (Riverine)
- __ Drainage Patterns (B10)
- __ Dry-Season Water Table (C2)
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- __ Shallow Aquitard (D3)
- __ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No _____ Depth (inches): 0-12

Water Table Present? Yes X No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

An adjacent ephemeral drainage of Pacheco Creek both overflow into the riparian forest here

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Pacheco Reservoir Expansion Project City/County: Santa Clara County Sampling Date: 1/30/20

Applicant/Owner: Santa Clara Valley Water District State: CA Sampling Point: 7003-VPL

Investigator(s): S. Hickey, H. Rundle Section, Township, Range:

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): flat Slope (%): 2

Subregion (LRR): LRR C: 15 - Central Coast Range Lat: Long: Datum:

Soil Map Unit Name: Riverwash NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? No Are "Normal Circumstances" present? Yes X No

Are Vegetation N, Soil N, or Hydrology N naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No ✓	**Is the Sampled Area within a Wetland?** Yes No ✓
Hydric Soil Present?	Yes	No ✓	
Wetland Hydrology Present?	Yes	No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size:)			
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 20x20)			
1. Salix laevigata	2	N	
2.			
3.			
4.			
5.			
	2 = Total Cover		
Herb Stratum (Plot size: 20x20)			
1. Erodium botrys	30	Y	FACU
2. Carduus pycnocephalus	15	N	NL
3. Avena barbata	10	N	NL
4. Geranium dissectum	20	Y	NL
5. Conium maculatum	6	N	FACW
6. Rumex crispus	3	N	FAC
7. Chenopodium californicum	2	N	NL
8. Cynodon dactylon	10	N	FACU
Unknown grasses 5%	100	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum % Cover of Biotic Crust

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No ✓

Remarks:

SOIL

Sampling Point: 7003-UPL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	7.5YR 3/2	100					gravelly sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: gravel

Depth (inches): 8

Hydric Soil Present? Yes ____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ____ Depth (inches): ____

Water Table Present? Yes ____ No ____ Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ____ No ____ Depth (inches): ____

Wetland Hydrology Present? Yes ____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Pacheco Reservoir Expansion Project City/County: Santa Clara County Sampling Date: 3/10/2020

Applicant/Owner: Santa Clara Valley Water District State: CA Sampling Point: 7004 -W

Investigator(s): P. Brillante, S. Hickey Section, Township, Range:

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): concave Slope (%): 3

Subregion (LRR): LRR C: 15 - Central Coast Range Lat: Long: Datum:

Soil Map Unit Name: Vallecitos loam 30-75% slopes, eroded MLRA 15 NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? N Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? N (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	Is the Sampled Area within a Wetland? Yes ✓ No ____
Hydric Soil Present?	Yes ✓	No ____	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks: fenced off wetland created by pump similar 2nd wetland adjacent also created by 2nd pump and in same fenced off area

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size 10 x 10)			
1 Salix laevigata	2	N	FACW
2			
3			
4			
	= Total Cover		
Sapling/Shrub Stratum (Plot size ____)			
1			
2			
3			
4			
5			
	= Total Cover		
Herb Stratum (Plot size 10 x 10)			
1 Eleocharis macrostachya	85	Y	OBL
2 Epilobium brachycarpum	10	N	FAC
3 Juncus xiphioides	1	N	OBL
4 Stachys sp.	1	N	-
5 Nasturtium officinale	1	N	OBL
6			
7			
8			
	98 = Total Cover		
Woody Vine Stratum (Plot size ____)			
1			
2			
	= Total Cover		

% Bare Ground in Herb Stratum: 0 % Cover of Biotic Crust:

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of	Multiply by
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks:

SOIL

Sampling Point: 7004 -W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks: no soil pit dug - hydric soils presumed

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ✓ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No ___ Depth (inches): 3

Water Table Present? Yes ___ No ___ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No ___ Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: small drainage drains wetland and flows downslope to intermittent drainage - hydrologically connected (~2 in depth)

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Pacheco Reservoir Expansion Project City/County: Santa Clara County Sampling Date: 3/10/2020

Applicant/Owner: Santa Clara Valley Water District State: CA Sampling Point: 7005 -UPL

Investigator(s): P. Brillante, S. Hickey Section, Township, Range:

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 3

Subregion (LRR): LRR C 15 - Central Coast Range Lat: Long: Datum:

Soil Map Unit Name: Vallecitos loam 30-75% slopes, eroded MLRA 15 NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? N Are "Normal Circumstances" present? Yes ✓ No

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? N (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No ✓	Is the Sampled Area within a Wetland? Yes ___ No ✓
Hydric Soil Present?	Yes ✓	No	
Wetland Hydrology Present?	Yes	No ✓	

Remarks: upland point for wetland

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ___)			
1			
2			
3			
4			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: ___)			
1			
2			
3			
4			
5			
	= Total Cover		
Herb Stratum (Plot size: 10x10)			
1 unknown grass = Avena	85	Y	UPL
2 Geranium carolinianum	5	N	UPL
3 Lactuca serriola	2	N	FACU
4 Silybum marianum	1	N	UPL
5			
6			
7			
8			
	93 = Total Cover		
Woody Vine Stratum (Plot size: ___)			
1			
2			
	= Total Cover		

% Bare Ground in Herb Stratum: 0 % Cover of Biotic Crust:

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of	Multiply by
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ___ No ✓

Remarks:

grass is vegetative and unidentifiable

* grassland community identified as Avena dominated during May botanical surveys

SOIL

Sampling Point: 7005-UPL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/1	100					loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- J Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): _____

Water Table Present? Yes ___ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes ___ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Pacheco Reservoir Expansion Project City/County: Santa Clara County Sampling Date: 3/10/2020

Applicant/Owner: Santa Clara Valley Water District State: CA Sampling Point: 7007

Investigator(s): P. Brillante, S. Hickey Section, Township, Range:

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): convex Slope (%): 45

Subregion (LRR): LRR C: 15 - Central Coast Range Lat: Long: Datum:

Soil Map Unit Name: water NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? N Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? N (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ____ No ✓

Hydric Soil Present? Yes ____ No ✓

Wetland Hydrology Present? Yes ✓ No ____

Is the Sampled Area within a Wetland? Yes ____ No ✓

Remarks: slope (bank) of stream channel tributary to Pacheco Creek

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 10 x 5)			
1. Xanthium strumarium	35	Y	FAC
2. Rumex crispus	8	N	FAC
3. Brassica nigra	40	Y	UPL
4. Silybum marianum	10	N	UPL
5. Centaurium melitensis	2	N	UPL
6. unk grass	2	N	–
7.			
8.			
	97 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species ____	x 1 = ____	
FACW species ____	x 2 = ____	
FAC species 43	x 3 = 129	
FACU species ____	x 4 = ____	
UPL species 52	x 5 = 260	
Column Totals: 95 (A)	389 (B)	

Prevalence Index = B/A = 4

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

✓ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No ✓

Remarks: Problematic veg: Outside of the bloom period for Xanthium strumarium so cover of this species is based on last season's thatch

Area is dominated by upland early season species

SOIL

Sampling Point: 7007

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 3/2	100					sandy clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ✓ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water Table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Pacheco Reservoir Expansion Project City/County: Santa Clara County Sampling Date: 3/10/20

Applicant/Owner: Santa Clara Valley Water District State: CA Sampling Point: 7608

Investigator(s): Shannon Hickey, Pam Brillante Section, Township, Range:

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): Convex Slope (%): 45

Subregion (LRR): LRR C: 15 - Central Coast Range Lat: Long: Datum:

Soil Map Unit Name: Pleasanton gravelly loam 9-15% slopes, eroded NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? NO Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? NO (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No ✓	**Is the Sampled Area within a Wetland?** Yes ____ No ✓
Hydric Soil Present?	Yes ____	No ✓	
Wetland Hydrology Present?	Yes ____	No ✓	

Remarks:
Upland hillside point

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 10 x 10)			
1. Brassica nigra	65	Y	UPL
2. Bromus hordeaceus	5	N	FACU
3. Silybum marianum	10	N	UPL
4. Centaurium melitensis	2	N	UPL
5. unk grass	10	N	–
6.			
7.			
8.			
	92 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

__ Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No ✓

Remarks:

SOIL

Sampling Point: _____

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
	SAME AS 7007							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Pacheco Reservoir Expansion Project City/County: Santa Clara County Sampling Date: 3/11/2020

Applicant/Owner: Santa Clara Valley Water District State: CA Sampling Point: 7009-W

Investigator(s): P. Brillante, S. Hickey Section, Township, Range:

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): concave Slope (%): 35

Subregion (LRR): LRR C: 15 - Central Coast Range Lat: Long: Datum:

Soil Map Unit Name: Vallecitos rocky loam 15-30% slopes, eroded NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? N Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? N (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	**Is the Sampled Area within a Wetland?** Yes ✓ No ____
Hydric Soil Present?	Yes ✓	No ____	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks: freshwater emergent wetland within the OHWM of drainage 528 (RUE-295)

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 10 x 4')			
1. Juncus balticus	13	N	FACW
2. Eleocharis macrostachya	15	Y	OBL
3. Festuca perennis	20	Y	FAC
4. Montia fontana	10	N	OBL
5. Stellaria media	5	N	FACU
6. Geranium carolinenesis	2	N	UPL
7. Cardamine oligosperma	1	N	FAC
8. Lythrum hyssopifolium	1	N	OBL
50=33.5 20=13.4	67	= Total Cover	
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species ____	x 1 =	____
FACW species ____	x 2 =	____
FAC species ____	x 3 =	____
FACU species ____	x 4 =	____
UPL species ____	x 5 =	____
Column Totals: ____ (A)		____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks:

SOIL

Sampling Point: 7009-W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks: no soil pit dug because within the ordinary high water mark of a drainage

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ✓ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No ___ Depth (inches): 0-4

Water Table Present? Yes ___ No ✓ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): ___

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: step pools; pools have surface water present 0-4 inches

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Pacheco Reservoir Expansion Project City/County: Santa Clara County Sampling Date: 3/11/2020

Applicant/Owner: Santa Clara Valley Water District State: CA Sampling Point: 7010-UPL

Investigator(s): P. Brillante, S. Hickey Section, Township, Range:

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): convex Slope (%): 35

Subregion (LRR): LRR C: 15 - Central Coast Range Lat: Long: Datum:

Soil Map Unit Name: Vallecitos rocky loam, 15-30% slopes, eroded NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? N Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? N (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No ✓	**Is the Sampled Area within a Wetland?** Yes ____ No ✓
Hydric Soil Present?	Yes ✓	No ____	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks: upland point adjacent to drainage & wetland

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 10x10)			
1. Stipa pulchra	25	Y	UPL
2. grasses *	55	Y	FAC
3. Geranium carolinianum	10	N	UPL
4. Ranunculus californicus	1	N	FACU
5. Epilobium sp.	3	N	FACW
6. Lupinus sp.	1	N	UPL
7. Juncus balticus	3	N	FACW
8.			
	98 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 1 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	6	x 2 =	6
FAC species	55	x 3 =	165
FACU species	1	x 4 =	4
UPL species	36	x 5 =	180
Column Totals:	98 (A)		355 (B)

Prevalence Index = B/A = 3.6

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No ✓

Remarks: *grasses unidentifiable but some species based on last season's thatch include Festuca perennis Hordeum marinum ssp gussoneanum

SOIL

Sampling Point: 7010-UPL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	7.5 3/1	100					clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ✓ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Pacheco Reservoir Expansion Project City/County: Santa Clara County Sampling Date: 3/11/2020

Applicant/Owner: Santa Clara Valley Water District State: CA Sampling Point: 7013

Investigator(s): P. Brillante, S Hickey Section, Township, Range: _____

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 5

Subregion (LRR): LRR C: 15 - Central Coast Range Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: water NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? N Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? N (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks: seasonal wetland on floodplain terrace of Pacheco Creek

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 20×20')	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix goodingii	15	Y	FACW
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 20×20')			
1. Xanthium strumarium	20	Y	FAC
2. Rorippa curvisiliqua	40	Y	OBL
3. Rumex crispus	15	N	FAC
4. Silybum marianum	1	N	UPL
5. Epilobium sp.	1	N	–
6. Geranium dissectum	2	N	UPL
7. Trifolium sp.	<1	N	–
8. unknown grass	3	N	–
50=41 20=	82	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: 7013

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-17	10YR 3/3	85	5YR 3/4	15	C	M	silty clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ✓ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ✓ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ✓ Depth (inches): _____

Water Table Present? Yes ____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Pacheco Reservoir Expansion Project City/County: Santa Clara County Sampling Date: 3/11/2020

Applicant/Owner: Santa Clara Valley Water District State: CA Sampling Point: 7014-UPL

Investigator(s): P Brillante, S. Hickey Section, Township, Range:

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 15

Subregion (LRR): LRR C: 15 - Central Coast Range Lat: Long: Datum:

Soil Map Unit Name: Pleasanton gravelly loam 9-15% slopes, eroded NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No ✓	Is the Sampled Area within a Wetland? Yes ____ No ✓
Hydric Soil Present?	Yes ____	No ✓	
Wetland Hydrology Present?	Yes ____	No ✓	

Remarks: upland point - slope above floodplain terrace

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 20×10')			
1. Quercus lobata	2		
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 20×10')			
1. unknown grasses M	30	Y	-
2. Artemisia douglasiana	30	Y	FAC
3. Geranium dissectum	5	N	UPL
4. Ranunculus californica	1	N	FACU
5. Collinsia parviflora	4	N	UPL
6. Viola pedunculata	1	N	UPL
7. Chlorogalum pomeridianum var. pomeridianum	3	N	UPL
8. Logfia gallica	4	N	UPL
Plantago erecta	<1	N	UPL
	78 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

50=39 20=15.6

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ____ (A)

Total Number of Dominant Species Across All Strata: ____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ✓ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No ✓

Remarks: grasses unidentifiable @ this time of year – likely not hydrophytic species based on adjacent grassland community identified during botanical surveys (Avena dominated)

SOIL

Sampling Point: 7014-UPL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/3	100					clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: rock

Depth (inches): 8

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Pacheco Reservoir Expansion Project City/County: Santa Clara County Sampling Date: 3/12/2020
Applicant/Owner: Santa Clara Valley Water District State: CA Sampling Point: 7015
Investigator(s): P. Brillante, S. Hickey Section, Township, Range:
Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): Slope (%): 2
Subregion (LRR): LRR C: 15 - Central Coast Range Lat: Long: Datum:
Soil Map Unit Name: water NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No (If no, explain in Remarks.)
Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? N Are "Normal Circumstances" present? Yes ✓ No
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? N (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ✓ No
Hydric Soil Present? Yes ✓ No
Wetland Hydrology Present? Yes ✓ No
Is the Sampled Area within a Wetland? Yes ✓ No

Remarks: Xanthium dominated seasonal wetland on bench within the active floodplain (within the OHWM of Pacheco Reservoir)

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size:)			
1			
2			
3			
4			
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1			
2			
3			
4			
5			
	= Total Cover		
Herb Stratum (Plot size: 20x20')			
1 Xanthium strumarium	55	Y	FAC
2 unknown grasses*	40	Y	
3 Pseudognaphalium luteoalbum	1	N	FAC
4 unknown apiaceae	1	N	-
5 unknown brassica	2	N	UPL
6 Epilobium sp.	1	N	-
7			
8			
	100 = Total Cover		
Woody Vine Stratum (Plot size:)			
1			
2			
	= Total Cover		

% Bare Ground in Herb Stratum: 0 % Cover of Biotic Crust:

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: (A)
Total Number of Dominant Species Across All Strata: (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: (A/B)

Prevalence Index worksheet:

Total % Cover of	Multiply by
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
__ Dominance Test is >50%
__ Prevalence Index is ≤3.0[1]
__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
✓ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No

Remarks: problematic veg due to time of year
grasses (@ least 8 different species) and herbs just coming up and not yet blooming/identifiable
grasses presumed to be hydrophytic since they are growing in an area that is regularly inundated

SOIL

Sampling Point: 7015

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-17	10YR 3/3	85	5YR 3/4	15	C	M	silty clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ✓ Surface Soil Cracks (B6)
- ✓ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): _____

Water Table Present? Yes ___ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Pacheco Reservoir Expansion Project City/County: Santa Clara County Sampling Date: 3/12/2020

Applicant/Owner: Santa Clara Valley Water District State: CA Sampling Point: 7016

Investigator(s): P. Brillante, S. Hickey Section, Township, Range:

Landform (hillslope, terrace, etc.): Hillslope - bench Local relief (concave, convex, none): convex Slope (%): 30

Subregion (LRR): LRR C: 15 - Central Coast Range Lat: Long: Datum:

Soil Map Unit Name: Water NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? NO Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? NO (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	Is the Sampled Area within a Wetland? Yes ✓ No ____
Hydric Soil Present?	Yes ✓	No ____	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks: Xanthium dominated seasonal wetland on a slope and then bench between the low-flow ottwm and the active floodplain ottwm of Pacheco Reservoir.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size ____)	Absolute % Cover	Dominant Species?	Indicator Status
1			
2			
3			
4			
	____ = Total Cover		

Sapling/Shrub Stratum (Plot size ____)			
1			
2			
3			
4			
5			
	____ = Total Cover		

Herb Stratum (Plot size 20×20)			
1 Xanthium strumarium	85	Yes	FAC
2 Unknown grass (just coming up)	5	NO	-
3			
4			
5			
6			
7			
8			
	90 = Total Cover		

Woody Vine Stratum (Plot size ____)			
1			
2			
	____ = Total Cover		

% Bare Ground in Herb Stratum 10 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of	Multiply by
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks: Problematic Veg - last years Unknown grasses and X. Xanthium due to time of year. mapping of vegetation boundary partially conducted in field based on last years population boundary and based on aerial imagry during growing season. but daminant species is hydrophytic

SOIL

Sampling Point 76b

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-17	10YR 3/1	95	5YR 3/4	15	C	M	silty clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ✓ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): _____

Water Table Present? Yes ___ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Pacheco Reservoir Expansion Project City/County: Santa Clara County Sampling Date: 3/12/2020

Applicant/Owner: Santa Clara Valley Water District State: CA Sampling Point: 7017

Investigator(s): P. Brillante, S. Hickey Section, Township, Range:

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 2

Subregion (LRR): LRR C: 15 - Central Coast Range Lat: Long: Datum:

Soil Map Unit Name: water NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	Is the Sampled Area within a Wetland? Yes ✓ No ____
Hydric Soil Present?	Yes ✓	No ____	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks: Seasonal wetland within the OHWM of Pacheco Reservoir

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size ____)			
1			
2			
3			
4			
	= Total Cover		
Sapling/Shrub Stratum (Plot size ____)			
1			
2			
3			
4			
5			
	= Total Cover		
Herb Stratum (Plot size 20×20')			
1 Xanthium strumarium	60	Y	FAC
2			
3			
4			
5			
6			
7			
8			
	= Total Cover		
Woody Vine Stratum (Plot size ____)			
1			
2			
	= Total Cover		

% Bare Ground in Herb Stratum 40 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of	Multiply by
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks: cover is from both last year's thatch (dead stems) and new seedlings coming up

SOIL

Sampling Point: 7017

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks: no soil pit dug, hydric soils presumed because within the Ohlwm

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ✓ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): _____

Water Table Present? Yes ✓ No ___ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: water table present presumed based on proximity to current water level

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Pacheco Reservoir Expansion Project City/County: Santa Clara County Sampling Date: 3/12/2020

Applicant/Owner: Santa Clara Valley Water District State: CA Sampling Point: 7018

Investigator(s): P. Brillante, S. Hickey Section, Township, Range:

Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): concave Slope (%): 2

Subregion (LRR): LRR C: 15 - Central Coast Range Lat: Long: Datum:

Soil Map Unit Name: water NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ____ No ____

Hydric Soil Present? Yes ____ No ____

Wetland Hydrology Present? Yes ____ No ____

Is the Sampled Area within a Wetland? Yes ____ No ____

Remarks: freshwater pond - filling out datasheet to characterize

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size ____)	Absolute % Cover	Dominant Species?	Indicator Status
1 Platanus racemosa (middle of pond)			
2 Quercus douglasiana (on banks)			
3			
4			
	= Total Cover		
Sapling/Shrub Stratum (Plot size ____)			
1 Salvia mellifera (on banks)			
2 Toxicodendron diversilobium			
3 Prunus ilicifolia			
4 Acmispon glaber			
5			
	= Total Cover		
Herb Stratum (Plot size ____)			
1			
2			
3			
4			
5			
6			
7			
8			
	= Total Cover		
Woody Vine Stratum (Plot size ____)			
1			
2			
	= Total Cover		

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC ____ (A)

Total Number of Dominant Species Across All Strata ____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC ____ (A/B)

Prevalence Index worksheet:

Total % Cover of	Multiply by
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

__ Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No ____

Remarks: no emergent vegetation
west-facing slope is oak woodland (blue oak)
east-facing is chaparral

SOIL

Sampling Point 7018

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No _____ Depth (inches): _____

Water Table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: water present
mallard pair in pond (intermittent - supports PlaRac)
very incised outlet channel \ with large boulders - currently dry
pond ~2 ft below ~10' OHWM and tall east bank (~20')

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Pacheco Reservoir Expansion Project City/County: Santa Clara County Sampling Date: 3/12/2020

Applicant/Owner: Santa Clara Valley Water District State: CA Sampling Point: 7019

Investigator(s): P. Brillante, S. Hickey Section, Township, Range:

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): concave Slope (%): 3

Subregion (LRR): LRR C: 15 - Central Coast Range Lat: Long: Datum:

Soil Map Unit Name: Vallecitos rocky loam, 15 to 30 percent slopes, eroded NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No	**Is the Sampled Area within a Wetland?** Yes ✓ No
Hydric Soil Present?	Yes ✓	No	
Wetland Hydrology Present?	Yes ✓	No	

Remarks: possible boundary of seasonal wetland → grass dominated but dominant grass possibly hydrophytic; likely still w/in seasonal wetland
↳ also gumplant in this area

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 20 x 20')			
1. unknown grasses*	70	Y	FAC
2. Grindelia camporum	20	N	FACW
3. Medicago polymorpha	7	N	FACU
4. Erodium cicutarium	1	N	UPL
5. Eleocharis macrostachya	1	N	OBL
6.			
7.			
8.			
	99 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum Ø % Cover of Biotic Crust

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No

Remarks: unknown grasses just starting to come up - at least one species is festuca perennis but possibly other species present (currently unidentifiable) (FAC)
Hordeum marinum ssp. gussonianum ID'd during May botanical surveys

7019

SOIL

Sampling Point:

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 2/1	87	10YR 8/8	5	D	M	loamy clay	
			7.5YR 4/6	8	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR C)
- ___ 1 cm Muck (A9) (LRR D)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (LRR C)
- ___ 2 cm Muck (A10) (LRR B)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (Inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required, check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (Nonriverine)
- ___ Sediment Deposits (B2) (Nonriverine)
- ___ Drift Deposits (B3) (Nonriverine)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ✓ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (Riverine)
- ___ Sediment Deposits (B2) (Riverine)
- ___ Drift Deposits (B3) (Riverine)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): _____

Water Table Present? Yes ___ No ✓ Depth (inches): _____

Saturation Present? (Includes capillary fringe) Yes ___ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Pacheco Reservoir Expansion Project City/County: Santa Clara County Sampling Date: 3/12/2020

Applicant/Owner: Santa Clara Valley Water District State: CA Sampling Point: 7020

Investigator(s): P. Brilante, S. Hickey Section, Township, Range:

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): concave Slope (%): 5

Subregion (LRR): LRR C: 15 - Central Coast Range Lat: Long: Datum:

Soil Map Unit Name: Vallecitos rocky loam, 15 to 30 percent slopes, eroded NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No ____	Is the Sampled Area within a Wetland? Yes ✓ No ____
Hydric Soil Present?	Yes ✓ No ____	
Wetland Hydrology Present?	Yes ✓ No ____	

Remarks: seasonal wetland on gentle hillslope / bench - fed by spring on slope

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 20x20')			
1. Eleocharis macrostachya	30	Y	OBL
2. Medicago polymorpha	25	Y	FACU
3. Geranium molle	15	N	UPL
4. Juncus xiphioides	8	N	OBL
5. Lotus corniculatus	1	N	FAC
6. Grindelia camporum	5	N	FACW
7. Juncus bufonius	1	N	FACW
8. Festuca perennis	12	N	FAC
Juncus balticus (N)	98	= Total Cover	FACW
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
50 = 49 20 = 19.6	____ = Total Cover		

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 38	x 1 = 38
FACW species 7	x 2 = 14
FAC species 13	x 3 = 39
FACU species 25	x 4 = 100
UPL species 15	x 5 = 75
Column Totals: 98 (A)	266 (B)

Prevalence Index = B/A = 2.7

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ✓ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks:

SOIL

Sampling Point: 7020

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 2/1	87	10YR 8/8	5	D	M	loamy clay	
			7.5YR 4/6	8	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ✓ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): _____

Water Table Present? Yes ___ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Pacheco Reservoir Expansion Project City/County: Santa Clara County Sampling Date: 3/13/2020

Applicant/Owner: Santa Clara Valley Water District State: CA Sampling Point: 7021

Investigator(s): P. Brillante, S. Hickey Section, Township, Range:

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 3

Subregion (LRR): LRR C: 15 - Central Coast Range Lat: Long: Datum:

Soil Map Unit Name: Vallecitos rocky loam, 15 to 30 percent slopes, eroded NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No ____	**Is the Sampled Area within a Wetland?** Yes ✓ No ____
Hydric Soil Present?	Yes ✓ No ____	
Wetland Hydrology Present?	Yes ✓ No ____	

Remarks: Spring on hillslope feeding wetland downslope on bench

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 10x10)	Absolute % Cover	Dominant Species?	Indicator Status
1. Quercus lobata	5	Y	FACU
2.			
3.			
4.			
	= Total Cover		

Sapling/Shrub Stratum (Plot size: 10x10')			
1. Quercus lobata	1	N	FACU
2. Rosa californica	20	Y	FAC
3.			
4.			
5.			
	21 = Total Cover		

Herb Stratum (Plot size: 10x5')			
1. Eleocharis macrostachya	25	Y	OBL
2. Juncus balticus	5	N	FACW
3. Lythrum hyssopifolium	7	N	OBL
4. Unknown grasses*	25	Y	FAC
5. Juncus xiphioides	2	N	OBL
6. Lysimachia arvensis	1	N	FAC
7. Geranium molle	1	N	UPL
8.			
50=33 20=13.2	66 = Total Cover		

Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks: * likely 2 species of grass – not identifiable this time of year
↳ Festuca perennis + Hordeum marinum gussoianum ID'd during May botanical surveys
top pool area contains lots of (stonewort) algae
bottom pool has no vegetation

SOIL

Sampling Point: 7021

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

no soil pit dug - hydric soils presumed

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No ___ Depth (inches): 4'

Water Table Present? Yes ✓ No ___ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

spring identified on USGS topo map

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Pacheco Reservoir Expansion Proj City/County: Santa Clara Sampling Date: 3/12/2020
Applicant/Owner: SCVWD State: CA Sampling Point: 7022
Investigator(s): P. Brillante, S. Hickey Section, Township, Range:
Landform (hillslope, terrace, etc.): hillslop Local relief (concave, convex, none): Slope (%): 5
Subregion (LRR): LRR C Lat: Long: Datum:
Soil Map Unit Name: Valleeitos rocky loam, 15 to 30 percent slopes, eroded NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No ✓	Is the Sampled Area within a Wetland? Yes ____ No ✓
Hydric Soil Present?	Yes ____	No ✓	
Wetland Hydrology Present?	Yes ____	No ✓	

Remarks: upland point for spring/wetland

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 40x40)	Absolute % Cover	Dominant Species?	Indicator Status
1. Quercus douglasiana	15	Y	UPL
2.			
3.			
4.			
	= Total Cover		

Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

Herb Stratum (Plot size: 10x10')			
1. Avena	15	N	UPL
2. Bromus hordeaceus	45	Y	FACU
3. Festuca perennis	5	N	FAC
4. Eleocharis macrostachya	5	N	OBL
5. Chlorogalum pomeridianum var pomeridianum	3	N	UPL
6. Marrubium vulgare	3	N	FACU
7. Heliotropium europaeum	13	N	UPL
8. Armispon sp	2	N	UPL
50=45.5 20=18.2	91	= Total Cover	

Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 10 % Cover of Biotic Crust ____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	5	x 1 =	5
FACW species	0	x 2 =	0
FAC species	5	x 3 =	15
FACU species	48	x 4 =	192
UPL species	48	x 5 =	240
Column Totals:	106 (A)		452 (B)

Prevalence Index = B/A = 4.3

Hydrophytic Vegetation Indicators:
___ Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No ✓

Remarks:

SOIL

Sampling Point: 7022

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/3	100					clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

could not dig deeper- hard soil

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: PREP City/County: Santa Clara Sampling Date: 3/12/2020
Applicant/Owner: SCVWD State: CA Sampling Point: 7023-W
Investigator(s): P. Baillante Section, Township, Range:
Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 5
Subregion (LRR): LRR C: 15 Lat: Long: Datum:
Soil Map Unit Name: Vallecitos rocky loam 15-30% slopes, eroded NWI classification: yes
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)
Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ✓ No ____
Hydric Soil Present? Yes ✓ No ____
Wetland Hydrology Present? Yes ✓ No ____
Is the Sampled Area within a Wetland? Yes ✓ No ____

Remarks: freshwater pond (stock pond) w/ west & part of south margins dominated by Eleocharis; fence divides E/W w/ east half margin much less vegetated; surrounded by grassland

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 10 x 10)			
1. Eleocharis macrostachya	8	Y	OBL
2. Xanthium spinosum	2	Y	FACU
3.			
4.			
5.			
6.			
7.			
8.			
	10 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	8	x 1 =	8
FACW species		x 2 =	
FAC species		x 3 =	
FACU species	2	x 4 =	8
UPL species		x 5 =	
Column Totals:	10 (A)		16 (B)

Prevalence Index = B/A = 1.6

Hydrophytic Vegetation Indicators:
___ Dominance Test is >50%
✓ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks: EleMac dense on west half of pond margin (N 8 feet wide)
South-East half: margin dominated by XanSpi & sparse EleMac on east margin

SOIL

Sampling Point: 7023-W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks: east half margin disturbed - lots cattle hoof prints
no soil pit dug

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ✓ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ✓ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No ____ Depth (inches): _____

Water Table Present? Yes ____ No ____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ____ No ____ Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: pond ~7 feet below OHWM; lots algae

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: PREP City/County: Santa Clara Sampling Date: 3/12/2020
Applicant/Owner: SCVWD State: CA Sampling Point: 7024-W
Investigator(s): P. Brillante, S Hickey Section, Township, Range:
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 8
Subregion (LRR): LRR C: 15 Lat: Long: Datum:
Soil Map Unit Name: Vallecitos rocky loam, 15-30% slopes, eroded NWI classification: yes
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)
Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ✓ No ____
Hydric Soil Present? Yes ✓ No ____
Wetland Hydrology Present? Yes ✓ No ____
Is the Sampled Area within a Wetland? Yes ✓ No ____

Remarks: seasonal wetland

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: ____)			
1. Eleocharis macrostachya	25	Y	OBL
2. Festuca perennis	5	N	FAC
3. Rumex crispus	1	N	FAC
4. Hordeum marinum ssp. gussoneanum	5	N	FAC
5. Poa secunda	15	N	FACU
6. Medicago polymorpha	2	N	FACU
7. Lythrum hyssopifolium	2	N	OBL
8. Juncus bufonius	40	Y	FACW
50 = 47.5 20 = 19	95		= Total Cover
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
__ Dominance Test is >50%
__ Prevalence Index is ≤3.0[1]
__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks: adjacent upland is annual grassland, Grindelia camporum, Amsinpon sp. (tiny yellow), Erodium cicutarium, Lepidium

SOIL

Sampling Point: 7024-W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

no soil pit dug - hydric soils presumed

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ✓ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No ___ Depth (inches): 0'

Water Table Present? Yes ___ No ___ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No ___ Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: PREP City/County: Santa Clara County Sampling Date: 3/12/2020
Applicant/Owner: SCVWD State: CA Sampling Point: 7025
Investigator(s): P. Billante, S. Hickey Section, Township, Range:
Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): none Slope (%): 10
Subregion (LRR): LRRC = 15 Lat: Long: Datum:
Soil Map Unit Name: Vallecitos rocky loam 15-30% slopes, eroded NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)
Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No ✓	Is the Sampled Area within a Wetland? Yes ____ No ✓
Hydric Soil Present?	Yes ✓	No ____	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks: upland point for wetland 7019 & 7020

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 20x20')			
1. Quercus douglasii	8	Y	UPL
2.			
3.			
4.			
	8 = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 10x10')			
1. Geranium molle	35	Y	UPL
2. Erodium cicutarium	15	Y	UPL
3. Bromus hordeaceus	10	N	FACU
4. Festuca perennis	15	Y	FAC
5. Grindelia camporum	5	N	FACW
6. Lepidium nitidum	3	N	FAC
7. Juncus bufonius	1	N	FACW
8. Lythrum hyssopifolium	1	N	OBL
50=42.5 20=17	85 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 15 % Cover of Biotic Crust ____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 25 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 1	x 1 = 1
FACW species 6	x 2 = 12
FAC species 18	x 3 = 54
FACU species 10	x 4 = 40
UPL species 58	x 5 = 290
Column Totals: 93 (A)	397 (B)

Prevalence Index = B/A = 4.3

Hydrophytic Vegetation Indicators:
___ Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No ✓

Remarks:

SOIL

Sampling Point: 7025

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

See 7020 for soils

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ✓ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): _____

Water Table Present? Yes ___ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Appendix D: Biological Resources

Pacheco Reservoir Expansion Project Design Level Geotechnical Investigations

Attachment 3 - Aquatic Resources Delineation

Exhibit 3B. Plant List

Scientific Name	Common Name	Indicator Status
Acacia dealbata	Silver wattle	NL
Acanthomintha lanceolata	Santa Clara thorn-mint	NL
Acer negundo	Boxelder	FACW
Achillea millefolium	Yarrow	FACU
Achyrachaena mollis	Blow wives	FAC
Acmispon americanus var. americanus	Spanish lotus	UPL
Acmispon glaber var. glaber	Deerweed	NL
Acmispon wrangelianus	Chilean trefoil	NL
Acroptilon repens	Russian knapweed	NL
Adenostoma fasciculatum var. fasciculatum	Chamise	NL
Adiantum jordanii	California maidenhair fern	FAC
Aesculus californica	Buckeye	NL
Agoseris grandiflorus	Large flowered agoseris	NL
Ailanthus altissima	Tree of heaven	FACU
Aira caryophyllea	Silvery hairgrass	FACU
Alisma triviale	Northern water plantain	OBL
Allium amplectans	Narrowleaf onion	NL
Amaranthus albus	Tumbleweed	FACU
Amaranthus retroflexus	Rough pigweed	FACU
Ambrosia psilostachya	Ragweed	FACU
Amsinckia intermedia	Common fiddleneck	NL
Amsinckia menziesii	Fiddleneck	NL
Anaphalis margaritacea	Pearly everlasting	FACU
Anthemis cotula	Dog fennel	FACU
Anthriscus caucalis	Bur chervil	NL
Antirrhinum vexillocalyculatum ssp. vexillocalyculatum	Wiry snapdragon	NL
Apocynum cannabinum	Indian hemp	FAC
Arceuthobium campylopodum	Pine dwarf mistletoe	NL
Arctostaphylos sp.	-	-
Artemisia californica	Coastal sage brush	NL
Artemisia douglasiana	California mugwort	FAC
Arthrocnemum subterminale	Parish's glasswort	FACW
Arundo donax	Giant reed	FACW
Asclepia californica		
Asclepias fascicularis	Milkweed	FAC
Atriplex prostrata	Fat-hen	FACW
Atriplex rosea	Redscale	FACU
Avena barbata	Slim oat	NL
Baccharis pilularis ssp. consanguinea	Coyote brush	NL
Baccharis salicifolia ssp. salicifolia	Mule fat	FAC
Barbarea vulgaris	Yellow rocket	FAC

Beta vulgaris ssp. maritima	Sea beet	NL
Bowlesia incana	Bowlesia	FACU
Brassica nigra	Black mustard	NL
Brassica rapa	Common mustard	FACU
Brickellia californica	California brickellbush	FACU
Briza minor	Little rattlesnake grass	FAC
Brodiaea elegans ssp. elegans	Harvest brodiaea	FACU
Bromus carinatus	California bromegrass	NL
Bromus diandrus	Ripgut brome	NL
Bromus hordeaceus	Soft chess	FACU
Bromus madritensis ssp. rubens	Foxtail brome	UPL
Calandrinia menziesii	Red maids	NL
Calandrinia sp.	-	-
Calendula arvensis	Field marigold	NL
Callitriche sp.	-	OBL
Calochortus albus	White fairy lantern	NL
Calochortus argillosus	Clay mariposa lily	NL
Calochortus venustus	Butterfly mariposa lily	NL
Calystegia sp.	-	-
Calystegia subacaulis ssp. subacaulis	Cambria morning glory	NL
Cannabis sativa	Herb	NL
Capsella bursa-pastoris	Shepherd's purse	FACU
Cardamine californica	Bitter cress	NL
Cardamine oligosperma	Idaho bittercress	FAC
Carduus pycnocephalus ssp. pycnocephalus	Italian thistle	NL
Carex nudata	Torrent sedge	FACW
Carya illinoinensis	Pecan	FAC
Castilleja attenuata	Narrow leaved owl's clover	NL
Castilleja exserta	Owl's clover	NL
Castilleja foliolosa	Texas paintbrush	NL
Castilleja sp.	-	-
Ceanothus cuneatus	Buck brush	NL
Celtis australis	European hackberry	NL
Centaurea calcitrapa	Purple star thistle	NL
Centaurea cyanus	Batchelor's button	FACU
Centaurea melitensis	Tocalote	NL
Centaurea solstitialis	Yellow starthistle	NL
Centromadia fitchii	Spikeweed	FACU
Centromadia parryi ssp. rudis	Pappose tarweed	FACW
Centromadia pungens ssp. pungens	Common tarweed	FAC
Cerastium glomeratum	Large mouse ears	UPL
Cercocarpus betuloides var. betuloides	Birch leaf mountain mahogany	NL

Chenopodium album	Lambs quarters	FACU
Chenopodium californicum	Soaproot	NL
Chlorogalum pomeridianum var. pomeridianum	Common soaproot	NL
Chorizanthe membranacea	Pink spineflower	NL
Cichorium intybus	Chicory	FACU
Cirsium cymosum var. *cymosum*	Peregrine thistle	NL
Cirsium occidentale	Western thistle	NL
Cirsium vulgare	Bullthistle	FACU
Cistus incanus	Hairy rockrose	NL
Clarkia breweri	Brewer's clarkia	NL
Clarkia purpurea	Purple clarkia	NL
Clarkia rubicunda	Ruby chalice clarkia	NL
Clarkia unguiculata	Elegant clarkia	NL
Claytonia parviflora ssp. parviflora	Miner'slettuce	FACU
Claytonia perfoliata	Miner's lettuce	FAC
Clematis lasiantha	Pipestem	NL
Collinsia heterophylla var. heterophylla	Purple chinese houses	NL
Collinsia parviflora	Few flowered blue eyed mary	NL
Collinsia sparsiflora var. collina	Hillside collinsia	NL
Conium maculatum	Poison hemlock	FACW
Convolvulus arvensis	Field bindweed	NL
Cordylanthus pilosus ssp. pilosus	Hairy bird's beak	NL
Corethrogyne filaginifolia	Common sandaster	NL
Cotula coronopifolia	Brass buttons	OBL
Crassula connata	Sand pygmy weed	FAC
Cressa truxillensis	Alkali weed	FACW
Croton setiger	Turkey-mullein	NL
Crypsis alopecuroides	Foxtail prickle grass	OBL
Crypsis schoenoides	Swamp grass	FACW
Cuscuta californica	California dodder	NL
Cynara cardunculus ssp. cardunculus	Artichoke	NL
Cynodon dactylon	Bermuda grass	FACU
Cynoglossum grande	Houndstongue	NL
Cynosurus echinatus	Dogtail grass	NL
Cyperus eragrostis	Tall cyperus	FACW
Cyperus niger	Brown cyperus	FACW
Datisca glomerata	Durango root	FACW
Datura wrightii	Jimsonweed	UPL
Daucus pusillus	American wild carrot	NL
Delphinium californicum ssp. interius	Hospital Canyon larkspur	FACU
Delphinium patens ssp. patens	Spreading larkspur	NL
Dichelostemma capitatum ssp. capitatum	Wild hyacinth	FACU
Digitaria sanguinalis	Crabgrass	FACU

Diplacus aurantiacus	Sticky monkeyflower	FACU
Dipsacus sativus	Indian teasel	NL
Distichlis spicata	Salt grass	FAC
Dittrichia graveolens	Stinkwort	NL
Downingia pulchella	Flatface downingia	OBL
Dryopteris arguta	Wood fern	NL
Dudleya cymosa ssp. paniculata	Diablo range dudleya	NL
Dysphania ambrosioides	Mexican tea	FAC
Dysphania pumilio	Tasmanian goosefoot	NL
Echinochloa crus-galli	Barnyard grass	FACW
Echinodorus berteroi	Burhead	OBL
Eleocharis macrostachya	Spike rush	OBL
Elymus condensatus	Giant wild rye	FACU
Elymus glaucus	Blue wildrye	FACU
Elymus triticoides	Beardless wild rye	FAC
Epilobium brachycarpum	Willow herb	NL
Epilobium canum	California fuchsia, zauschneria	NL
Epilobium ciliatum ssp. ciliatum	Willow herb	FACW
Epilobium densiflorum	Willow herb	FACW
Equisetum laevigatum	Smooth scouring rush	FACW
Eriastrum abramsii	Abrams' eriastrum	NL
Ericameria linearifolia	Interior goldenbush	NL
Erigeron bonariensis	Flax-leaved horseweed	FACU
Erigeron canadensis	Canada horseweed	FACU
Erigeron philadelphicus var. *philadelphicus*	Philadelphia fleabane	FACU
Eriodictyon californicum	Yerba santa	NL
Eriogonum fasciculatum	California buckwheat	NL
Eriogonum nudum	Naked buckwheat	NL
Eriogonum roseum	Wand buckwheat	NL
Eriogonum wrightii var. trachygonum	Wright s buckwheat	NL
Eriophyllum confertiflorum	Yellow yarrow	NL
Erodium botrys	Big heron bill	FACU
Erodium cicutarium	Coastal heron's bill	NL
Erodium moschatum	Whitestem filaree	NL
Eryngium aristulatum var. hooveri	Hoover's button celery	OBL
Erythranthe cardinalis	Cardinal monkey flower	FACW
Erythranthe guttata	Yellow monkey flower	OBL
Eschscholzia caespitosa	Tufted eschscholzia	NL
Eschscholzia californica	California poppy	NL
Eucalyptus sp.	-	-
Euphorbia ocellata	Contura creek spurge	NL
Euphorbia peplus	Petty spurge	NL
Euthamia occidentalis	Western goldenrod	FACW

Festuca bromoides	Brome fescue	FACU
Festuca perennis	Italian rye grass	FAC
Festuca pratensis	Meadow fescue	NL
Foeniculum vulgare	Fennel	NL
Frangula californica	California coffeeberry	NL
Frankenia salina	Alkali heath	FACW
Fraxinus dipetala	Two petaled ash	NL
Galium andrewsii ssp. andrewsii	Phlox leaved bedstraw	NL
Galium aparine	Cleavers	FACU
Galium murale	Tiny bedstraw	NL
Galium parisiense	Wall bedstraw	UPL
Galium porrigens	Climbing bedstraw	NL
Galium sp.	-	-
Gastridium phleoides	Nit grass	FACU
Geranium dissectum	Wild geranium	NL
Geranium molle	Crane's bill geranium	NL
Gilia achilleifolia ssp. achilleifolia	California gilia	NL
Gilia tricolor ssp. tricolor	Bird's eyes	NL
Glycyrrhiza lepidota	Lichorice	FAC
Gnaphalium palustre	Lowland cudweed	FACW
Grindelia camporum	Gumweed	FACW
Helenium puberulum	Sneezeweed	FACW
Helianthus annuus	Hairy leaved sunflower	FACU
Helianthus californicus	California sunflower	OBL
Heliotropium curassavicum var. oculatum	Seaside heliotrope	FACU
Helminthotheca echioides	Bristly ox-tongue	FAC
Hemizonia congesta ssp. luzulifolia	Woodrush tarweed	NL
Heteromeles arbutifolia	Toyon	NL
Heterotheca oregona var. rudis	Red oregon goldenaster	FACU
Heterotheca sessiliflora ssp. echioides	Bristly goldenaster	NL
Hirschfeldia incana	Mustard	NL
Hoita macrostachya	California hemp	OBL
Holocarpha virgata ssp. virgata	Narrow tarplant	NL
Holozonia filipes	Holozonia	FACU
Hordeum marinum ssp. gussoneanum	Mediterranean barley	FAC
Hordeum murinum ssp. leporinum	Farmer's foxtail	FACU
Hypochaeris glabra	Smooth cats ear	NL
Iris macrosiphon	Ground iris	NL
Juglans hindsii	Northern california black walnut	FAC
Juglans regia	English walnut	NL
Juncus balticus	Baltic rush	FACW
Juncus bufonius var. bufonius	Toad rush	FACW

Juncus mexicanus	Mexican rush	FACW
Juncus patens	Rush	FACW
Juncus xiphioides	Iris-leaved rush	OBL
Juniperus californica	California juniper	NL
Keckiella breviflora	Gaping keckiella	NL
Kickxia spuria	Fluellin	NL
Lactuca serriola	Prickly lettuce	FACU
Lagophylla ramosissima	Common hareleaf	NL
Lamarckia aurea	Goldentop	FACU
Lamium amplexicaule	Henbit	NL
Lasthenia californica ssp. californica	California goldfields	FACU
Lasthenia glaberrima	Smooth goldfields	OBL
Lasthenia sp.	-	-
Lathyrus vestitus var. vestitus	Hillside pea	NL
Lemna sp.	-	OBL
Lepidium draba	Whitetop	NL
Lepidium latifolium	Perennial pepperweed	FAC
Lepidium nitidum	Shining pepper grass	FAC
Lepidium sp.	-	-
Leptosiphon bicolor	True babystars	UPL
Leptosiphon ciliatus	Whiskerbrush	NL
Leptosiphon grandiflorus	Large-flowered leptosiphon	NL
Lessingia sp.	-	-
Logfia gallica	Narrowleaf cottonrose	NL
Lomatium caruifolium var. caruifolium	Caraway leaved lomatium	FACW
Lomatium dasycarpum	Lace parsnip	NL
Lomatium utriculatum	Hog fennel	NL
Lonicera hispidula	Pink honeysuckle	FACU
Lonicera subspicata var. *denudata*	Chaparral honeysuckle	NL
Lotus corniculatus	Bird's foot trefoil	FAC
Lupinus albifrons	Silver bush lupine	NL
Lupinus bicolor	Lupine	NL
Lupinus microcarpus var. *microcarpus*	Chick lupine	NL
Lupinus succulentus	Arroyo lupine	NL
Luzula comosa	Hairy wood rush	FAC
Lycopersicon esculentum	Tomato	NL
Lysimachia arvensis	Scarlet pimpernel	FAC
Lythrum californicum	Common loosestrife	OBL
Lythrum hyssopifolia	Hyssop loosestrife	OBL
Madia elegans	Common madia	NL
Madia gracilis	Gumweed	NL
Malacothamnus hallii	Hall's bush mallow	NL
Malosma laurina	Laurel sumac	NL

Malus sp.	-	-
Malva neglecta	Dwarf mallow	NL
Malva sp.	-	NL
Malvella leprosa	Alkali mallow	FACU
Marah fabacea	California man-root	NL
Marrubium vulgare	White horehound	FACU
Marsilea vestita ssp. vestita	Hairy pepperwort	OBL
Matricaria discoidea	Pineapple weed	FACU
Medicago polymorpha	California burclover	FACU
Medicago sativa	Alfalfa	UPL
Melica imperfecta	Coast range melic	NL
Melica torreyana	Torrey's melica	NL
Melilotus albus	White sweetclover	NL
Melilotus indicus	Annual yellow sweetclover	FACU
Melissa officinalis	Lemon balm	UPL
Mentha pulegium	Pennyroyal	OBL
Mentha suaveolens	Apple mint	FACW
Micranthes californica	Greene's saxifrage	FACW
Micropus californicus var. californicus	Slender cottonweed	FACU
Microseris elegans	Elegant silverpuffs	NL
Microsteris gracilis	Slender phlox	FACU
Mimetanthe pilosa	Snouted monkey flower	FACW
MInuatia californica	California sandwort	FACU
Monardella villosa ssp. villosa	Coyote mint	FACU
Monolopia gracilens	Woodland monolopia	NL
Nasturtium officinale	Watercress	OBL
Navarretia mellita	Honeyscented pincushionplant	FAC
Navarretia prostrata	Prostrate vernal pool navarretia	OBL
Navarretia pubescens	Downy pincushionplant	NL
Nemophila heterophylla	Canyon nemophila	NL
Nemophila menziesii var. atomaria	Baby blue eyes	NL
Nemophila menziesii var. menziesii	Baby blue eyes	NL
Nerium oleander	Oleander	NL
Nicotiana acuminata var. multiflora	Many flowered tobacco	NL
Olea europaea	Olive	NL
Opuntia ficus-indica	Tuna	NL
Packera breweri	Brewer’s ragwort	NL
Parentucellia viscosa	Yellow parentucellia	FAC
Paspalum dilatatum	Dallis grass	FAC
Paspalum distichum	Knot grass	FACW
Pectocarya pusilla	Little combseed	NL

Pellaea andromedifolia	Coffee fern	NL
Penstemon heterophyllus	Foothill penstemon	NL
Pentagramma triangularis ssp. triangularis	Gold back fern	NL
Perideridia californica	California yampah	FACW
Persicaria amphibia	Water smartweed	OBL
Persicaria punctata	Dotted smartweed	OBL
Phacelia imbricata var. imbricata	-	NL
Phalaris minor	Mediterranean canarygrass	NL
Pholistoma auritum var. auritum	Blue fiesta flower	NL
Pholistoma membranaceum	White fiesta flower	NL
Phoradendron leucarpum ssp. macrophyllum	Big leaf mistletoe	NL
Phyla lanceolata	Lance leaf lippia	OBL
Phyla nodiflora	Common lippia	FACW
Pinus sabiniana	Foothill pine	NL
Pittosporum tenuifolium	Short leaf box	NL
Plagiobothrys canescens var. canescens	Valley popcornflower	NL
Plagiobothrys greenei	Greene's popcornflower	FACW
Plagiobothrys nothofulvus	Rusty haired popcorn flower	FAC
Plagiobothrys stipitatus var. micranthus	Common vernal pool allocarya	FACW
Plantago coronopus	Cut leaf plantain	FAC
Plantago erecta	California plantain	NL
Plantago lanceolata	Ribwort	FAC
Plantago major	Common plantain	FAC
Platanus racemosa	California sycamore	FAC
Plectritis ciliosa	Long spurred plectritis	FACU
Plectritis macrocera	Plectritis	FACU
Poa annua	Annual blue grass	FAC
Poa secunda ssp. secunda	Sandberg's bluegrass	FACU
Poa trivialis	Rough blue grass	FACW
Polygonum aviculare	Prostrate knotweed	FAC
Polypodium californicum	California polypody	NL
Polypogon monspeliensis	Annual beard grass	FACW
Populus fremontii ssp. fremontii	Cottonwood	FAC
Populus trichocarpa	Black cottonwood	FAC
Portulaca oleracea	Common purslane	FAC
Primula clevelandii var. patula	Padre's shooting star	NL
Prunus dulcis	Almond	NL
Prunus ilicifolia ssp. ilicifolia	Holly leaf cherry	NL
Prunus sp.	-	-
Pseudognaphalium californicum	Ladies' tobacco	NL
Pseudognaphalium luteoalbum	Jersey cudweed	FAC
Psilocarphus tenellus	Slender woolly heads	OBL

Ptelea crenulata	Hop tree	NL
Pterostegia drymarioides	Fairy mist	NL
Pyrus sp.	-	-
Quercus agrifolia var. agrifolia	Coast live oak	NL
Quercus berberidifolia	Inland scrub oak	NL
Quercus douglasii	Blue oak	NL
Quercus lobata	Valley oak	FACU
Quercus wislizeni var. wislizeni	Interior live oak	NL
Ramalina menziesii	Lace lichen	-
Ranunculus californicus	Common buttercup	FACU
Ranunculus muricatus	Buttercup	FACW
Raphanus sativus	Jointed charlock	NL
Rhamnus crocea	Redberry	NL
Rhamnus ilicifolia	Evergreen buckthorn	NL
Rhus ovata	Sugar bush	NL
Ribes californicum var. californicum	California gooseberry	NL
Ribes sp.	-	-
Robinia pseudoacacia	Black locust	FACU
Rorippa curvisiliqua	Curvepod yellow cress	OBL
Rosa californica	California wild rose	FAC
Rubus armeniacus	Himalayan blackberry	FAC
Rubus ursinus	California blackberry	FAC
Rumex acetosella	Sheep sorrel	FACU
Rumex conglomeratus	Green dock	FACW
Rumex crispus	Curly dock	FAC
Rumex pulcher	Fiddleleaf dock	FAC
Rumex salicifolius	Willow leaved dock	FACW
Salicornia pacifica	Pickelweed	NL
Salix exigua	Narrowleaf willow	FACW
Salix gooddingii	Black willow	FACW
Salix laevigata	Polished willow	FACW
Salix lasiolepis	Arroyo willow	FACW
Salsola tragus	Russian thistle	FACU
Salvia columbariae	Chia sage	NL
Salvia mellifera	Black sage	NL
Sambucus nigra ssp. caerulea	Blue elderberry	FACU
Sanicula bipinnata	Poison sanicle	NL
Sanicula bipinnatifida	Purple sanicle	NL
Sanicula crassicaulis	Pacific sanicle	NL
Scandix pecten-veneris	Shepherd's needle	NL
Schinus molle	Peruvian pepper tree	FACU
Schoenoplectus acutus var. occidentalis	Tule, hardstem bulrush	OBL
Schoenoplectus americanus	Chairmaker's bulrush	OBL

Scrophularia californica	California bee plant	FAC
Scutellaria siphocampyloides	Grayleaf skullcap	FACU
Sedum spathulifolium	Pacific stonecrop	NL
Selaginella bigelovii	Bigelow's moss fern	NL
Senecio vulgaris	Common groundsel	FACU
Sequoia sempervirens	Coast redwood	NL
Sidalcea malviflora ssp. laciniata	Laciniate checker mallow	FACW
Silybum marianum	Milk thistle	NL
Sinapis arvensis	Charlock	NL
Sisyrinchium bellum	Blue eyed grass	FACW
Solanum americanum	White nightshade	FACU
Solanum umbelliferum	Blue witch	NL
Soliva sessilis	South american soliva	FACU
Sonchus asper ssp. asper	Sow thistle	FAC
Sonchus oleraceus	Sow thistle	UPL
Sparganium eurycarpum	Broadfruit bur reed	OBL
Spergularia bocconi	Boccone's sand spurry	FACW
Spergularia rubra	Purple sand spurry	FAC
Spiranthes porrifolia	Western ladies tresses	FACW
Stachys ajugoides	Hedge nettle	OBL
Stachys albens	Cobwebby hedge nettle	OBL
Stachys bullata	Southern hedge nettle	NL
Stellaria media	Chickweed	FACU
Stephanomeria virgata ssp. pleurocarpa	Tall stephanomeria	NL
Stipa miliacea var. miliacea	Smilo grass	NL
Stipa pulchra	Purple needle grass	NL
Streptanthus albidus ssp*. peramoenus*	Most beautiful jewelflower	NL
Symphoricarpos albus var*. laevigatus*	Snowberry	FACU
Symphyotrichum lanceolatum var. hesperium	Western lance leaf aster	OBL
Symphyotrichum sp.	-	-
Tamarix parviflora	Tamarisk	FAC
Tamarix ramosissima	Tamarisk	NL
Taraxacum erythrospermum	Red-seeded dandelion	NL
Taraxacum officinale	Red seeded dandelion	FACU
Thalictrum fendleri var. polycarpum	Torrey's meadow rue	FAC
Thysanocarpus curvipes ssp. curvipes	-	NL
Thysanocarpus laciniatus	Narrow leaved lacepod	NL
Torilis arvensis	Field hedge parsley	NL
Toxicodendron diversilobum	Poison oak	FACU
Toxicoscordion fremontii	Fremont's star lily	NL
Tribulus terrestris	Puncture vine	NL
Trichostema lanceolatum	Vinegarweed	FACU
Trifolium angustifolium	Narrow leaved clover	NL

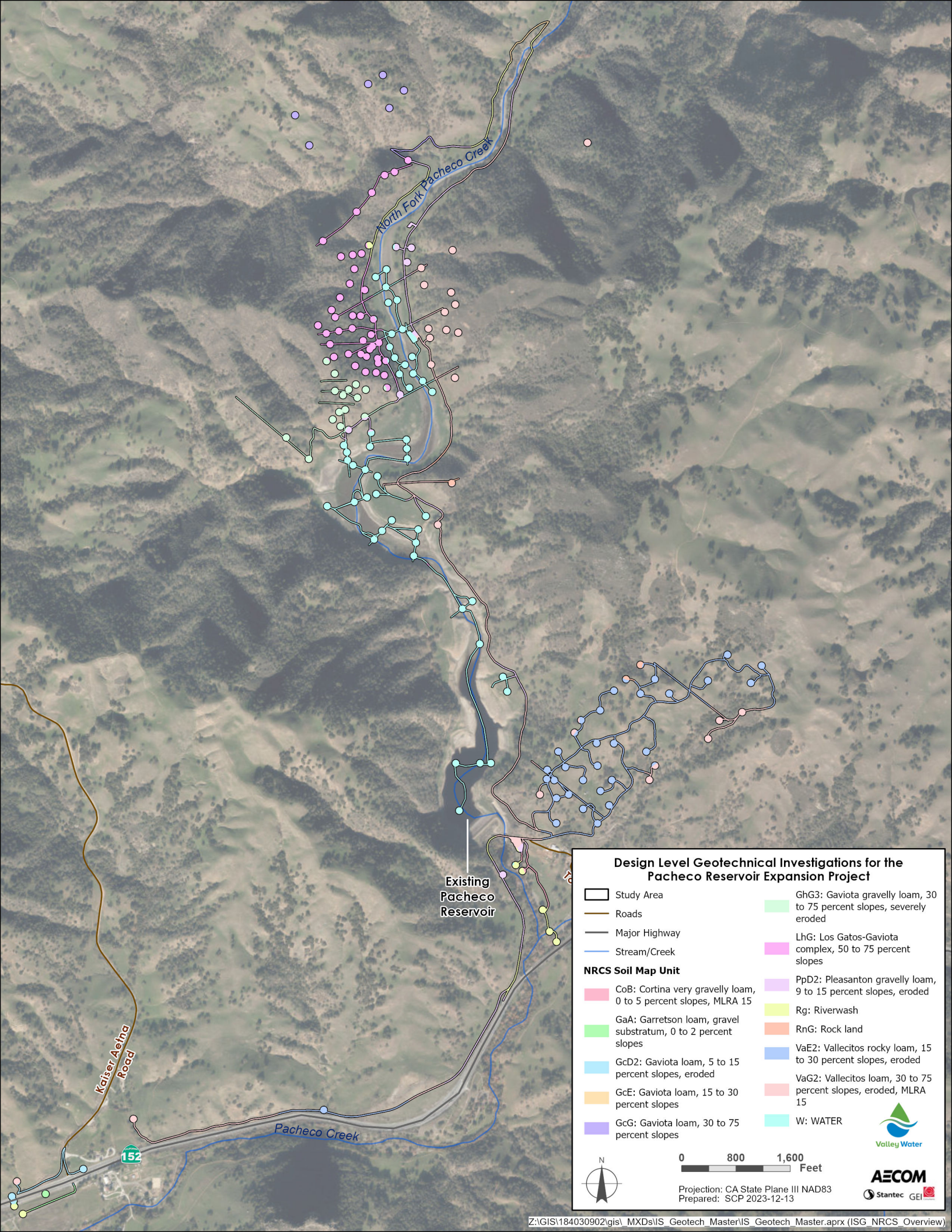
Trifolium campestre	Hop clover	NL
Trifolium depauperatum	Dwarf sack clover	FAC
Trifolium dubium	Shamrock	UPL
Trifolium fragiferum	Strawberry clover	FAC
Trifolium glomeratum	Clustered clover	NL
Trifolium gracilentum	Pinpoint clover	NL
Trifolium hydrophilum	Saline clover	FAC
Trifolium hirtum	Rose clover	NL
Trifolium obtusiflorum	Clammy clover	FAC
Trifolium variegatum var. variegatum	Variegated clover	FAC
Trifolium willdenovii	Tomcat clover	FACW
Triphysaria eriantha ssp. eriantha	Butter 'n' eggs	NL
Triphysaria pusilla	Little owl's clover	NL
Triteleia hyacinthina	Wild hyacinth	FAC
Triteleia laxa	Ithuriel's spear	NL
Tropidocarpum gracile	Slender tropidocarpum	NL
Typha angustifolia	Narrow leaf cattail	OBL
Typha latifolia	Broadleaf cattail	OBL
Typha sp.	-	-
Ulmus americana	American elm	FAC
Umbellularia californica	California bay	FAC
Uropappus lindleyi	Silver puffs	NL
Urospermum picroides	Bristly tail seed	NL
Urtica dioica	Stinging nettle	FAC
Urtica urens	Annual stinging nettle	NL
Verbascum blattaria	Moth mullein	UPL
Verbena bracteata	Bracted verbena	FAC
Verbena lasiostachys var. scabrida	Robust vervain	FAC
Veronica americana	American brooklime	OBL
Veronica catenata	Chain speedwell	NL
Veronica peregrina ssp. xalapensis	Speedwell	FAC
Veronica persica	Bird's eye speedwell	NL
Vicia americana ssp. americana	American vetch	FAC
Vicia sativa	Spring vetch	FACU
Vicia villosa ssp. villosa	Hairy vetch	NL
Vinca major	Vinca	NL
Viola pedunculata	California golden violet	NL
Vitis vinifera	Cultivated grape	NL
Wyethia helenioides	Whitehead wyethia	FACW
Xanthium spinosum	Spiny cocklebur	FACU
Xanthium strumarium	Cocklebur	FAC
Zeltnera muehlenbergii	Muehlenberg's centaury	FAC

Appendix D: Biological Resources

Pacheco Reservoir Expansion Project Design Level Geotechnical Investigations

Attachment 3 - Aquatic Resources Delineation

Exhibit 3C. Soils Maps and Table



Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

- Study Area
- Roads
- Major Highway
- Stream/Creek

NRCS Soil Map Unit

- CoB: Cortina very gravelly loam, 0 to 5 percent slopes, MLRA 15
- GaA: Garretson loam, gravel substratum, 0 to 2 percent slopes
- GcD2: Gaviota loam, 5 to 15 percent slopes, eroded
- GcE: Gaviota loam, 15 to 30 percent slopes
- GcG: Gaviota loam, 30 to 75 percent slopes
- GhG3: Gaviota gravelly loam, 30 to 75 percent slopes, severely eroded
- LhG: Los Gatos-Gaviota complex, 50 to 75 percent slopes
- PpD2: Pleasanton gravelly loam, 9 to 15 percent slopes, eroded
- Rg: Riverwash
- RnG: Rock land
- VaE2: Vallecitos rocky loam, 15 to 30 percent slopes, eroded
- VaG2: Vallecitos loam, 30 to 75 percent slopes, eroded, MLRA 15
- W: WATER

N

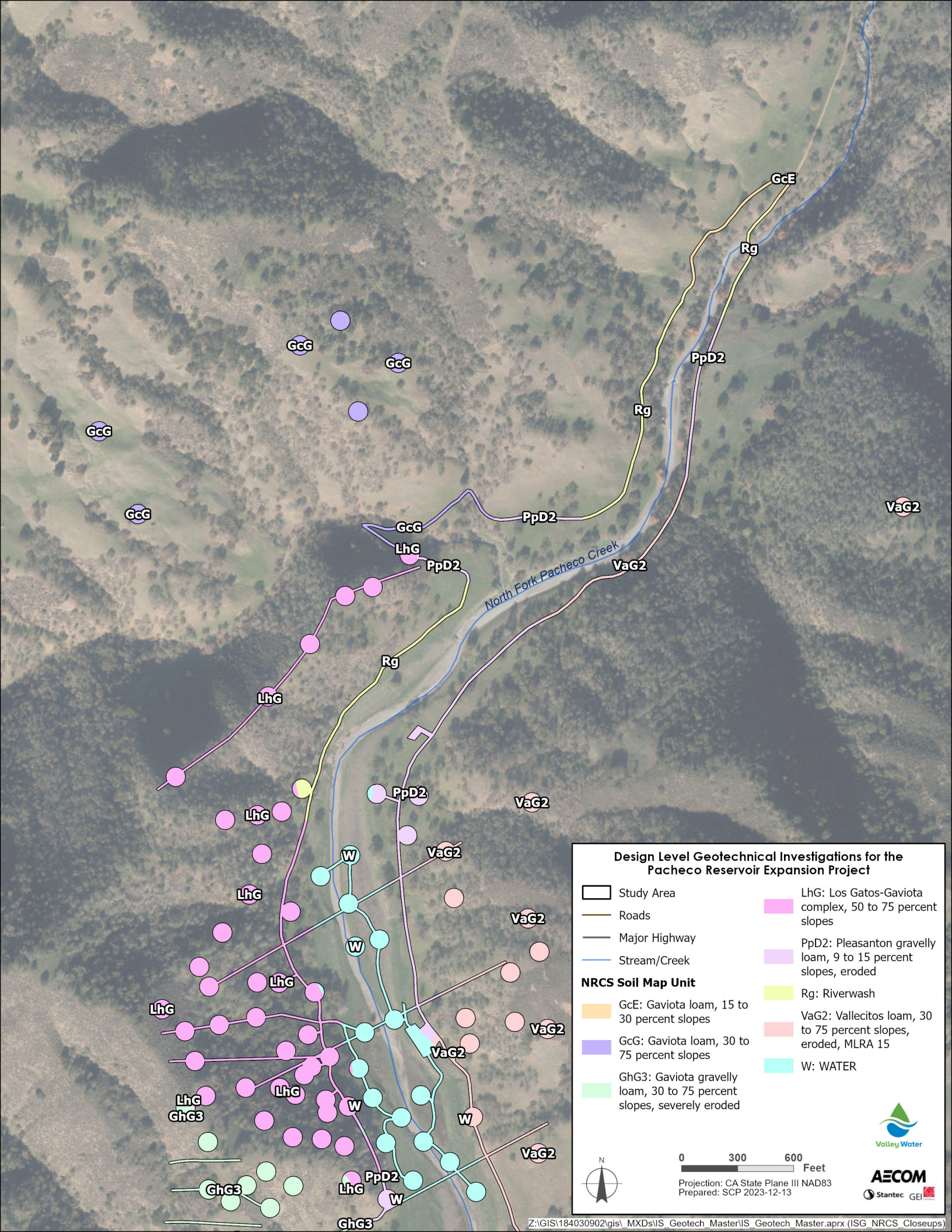
0 800 1,600 Feet

Projection: CA State Plane III NAD83
Prepared: SCP 2023-12-13

Valley Water

AECOM Stantec GEI

Z:\GIS\184030902\gis_MXDs\IS_Geotech_Master\IS_Geotech_Master.aprx (ISG_NRCS_Overview)



Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

- Study Area
- Roads
- Major Highway
- Stream/Creek

NRCS Soil Map Unit

- GcE: Gaviota loam, 15 to 30 percent slopes
- GcG: Gaviota loam, 30 to 75 percent slopes
- GhG3: Gaviota gravelly loam, 30 to 75 percent slopes, severely eroded
- LhG: Los Gatos-Gaviota complex, 50 to 75 percent slopes
- PpD2: Pleasanton gravelly loam, 9 to 15 percent slopes, eroded
- Rg: Riverwash
- VaG2: Vallecitos loam, 30 to 75 percent slopes, eroded, MLRA 15
- W: WATER

N

0 300 600 Feet

Projection: CA State Plane III NAD83
Prepared: SCP 2023-12-13

Valley Water

AECOM
Stantec GEI

Z:\GIS\184030902\gis_MXDs\IS_Geotech_Master\IS_Geotech_Master.aprx (ISG_NRCS_Closeups)

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

- Study Area
- Roads
- Major Highway
- Stream/Creek

NRCS Soil Map Unit

- GhG3: Gaviota gravelly loam, 30 to 75 percent slopes, severely eroded
- LhG: Los Gatos-Gaviota complex, 50 to 75 percent slopes
- PpD2: Pleasanton gravelly loam, 9 to 15 percent slopes, eroded
- Rg: Riverwash
- RnG: Rock land
- VaE2: Vallecitos rocky loam, 15 to 30 percent slopes, eroded
- VaG2: Vallecitos loam, 30 to 75 percent slopes, eroded, MLRA 15
- W: WATER

N

0 300 600 Feet

Projection: CA State Plane III NAD83
Prepared: SCP 2023-12-13

Valley Water

AECOM Stantec GEI

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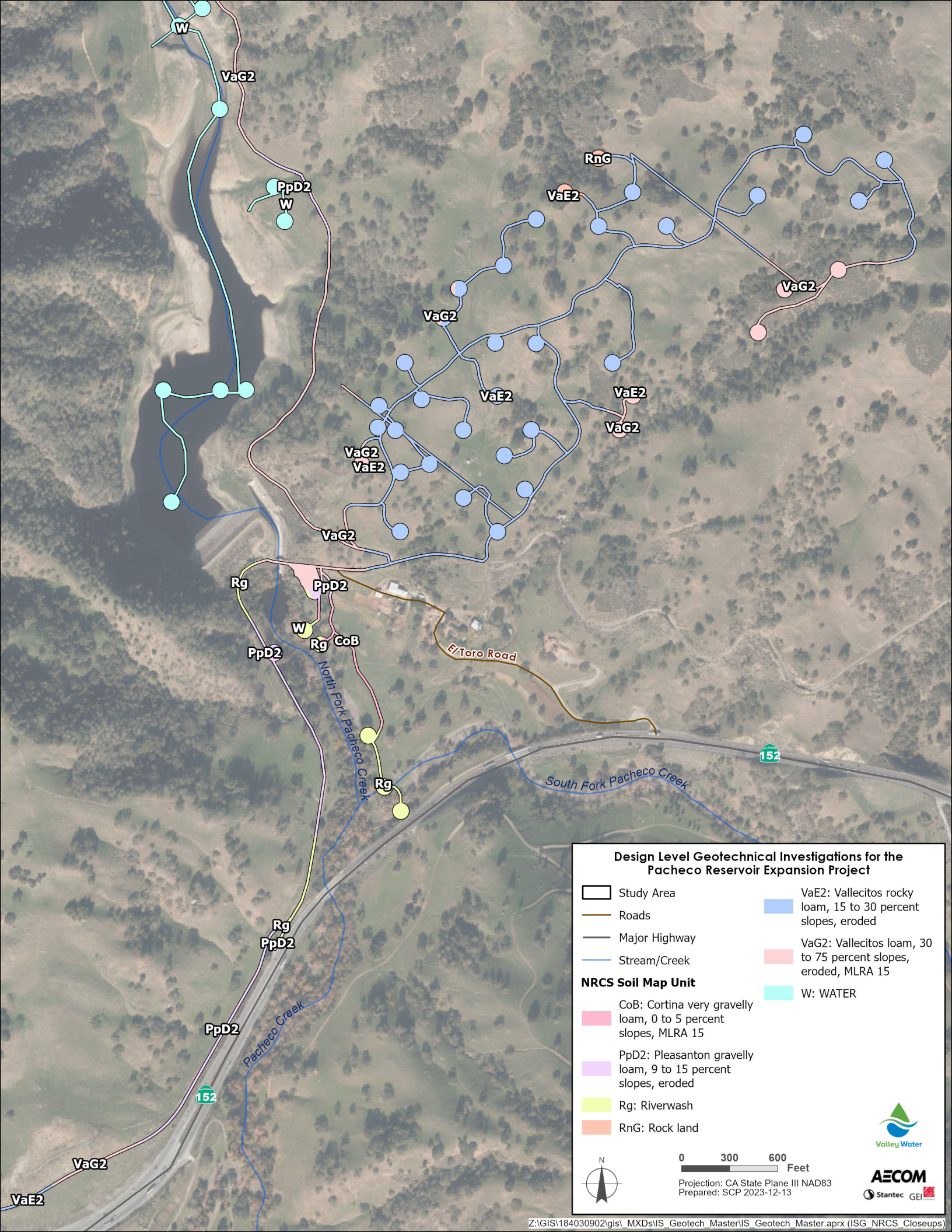
W
VaG2
PpD2
W
RnG
VaE2
VaG2
VaG2
VaE2
VaE2
VaG2
VaG2
VaE2
VaG2
Rg
PpD2
W
Rg
CoB
PpD2
El Toro Road
North Fork Pacheco Creek
Rg
152
South Fork Pacheco Creek
Rg
PpD2
PpD2
Pacheco Creek
152
VaG2
VaE2
Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project
Study Area
Roads
Major Highway
Stream/Creek
NRCS Soil Map Unit
CoB: Cortina very gravelly loam, 0 to 5 percent slopes, MLRA 15
PpD2: Pleasanton gravelly loam, 9 to 15 percent slopes, eroded
Rg: Riverwash
RnG: Rock land
VaE2: Vallecitos rocky loam, 15 to 30 percent slopes, eroded
VaG2: Vallecitos loam, 30 to 75 percent slopes, eroded, MLRA 15
W: WATER
N
0 300 600
Feet
Projection: CA State Plane III NAD83
Prepared: SCP 2023-12-13
Valley Water
AECOM
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GEI
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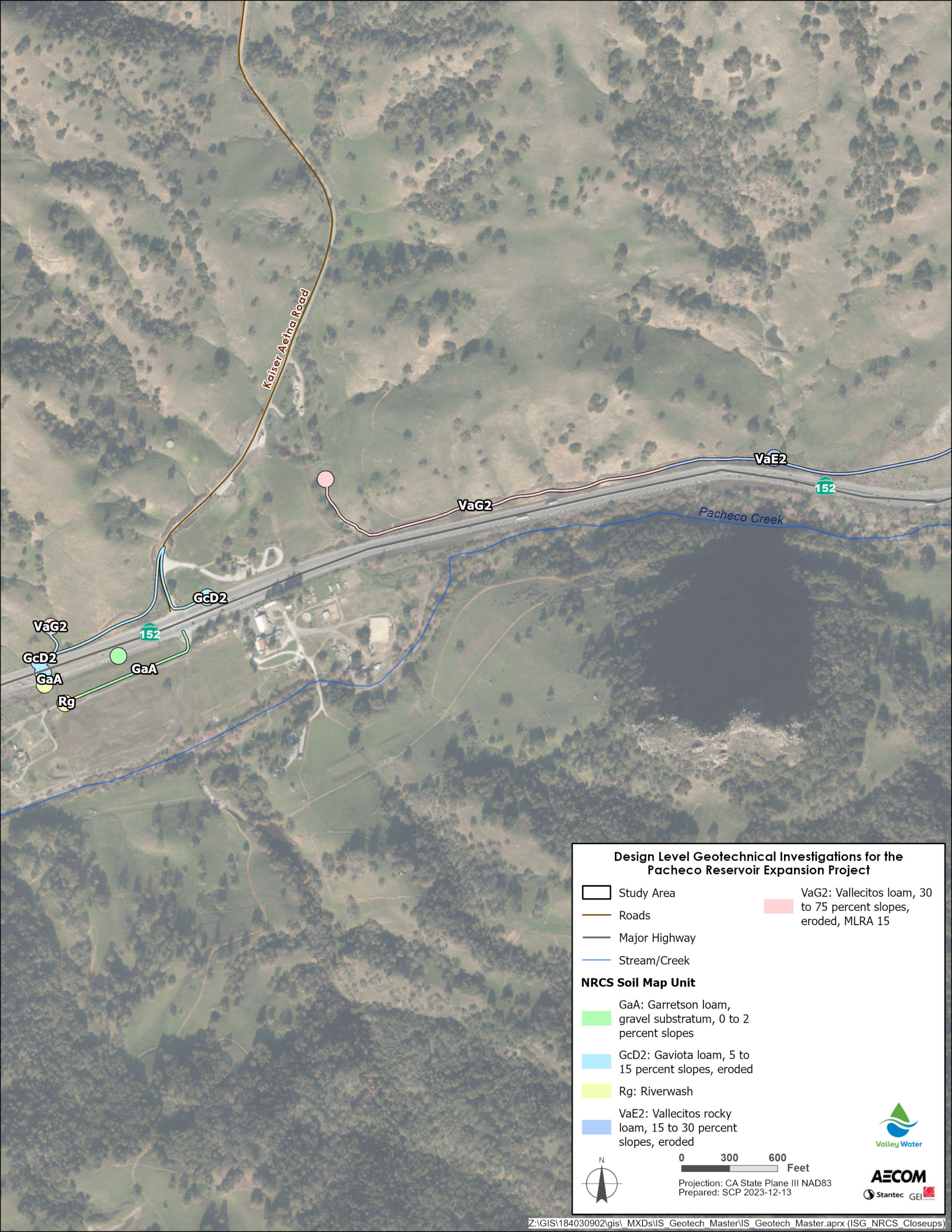
Kaiser Aetna Road
VaE2
VaG2
Pacheco Creek
152
GcD2
VaG2
GcD2
GaA
GaA
Rg
Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project
Study Area
Roads
Major Highway
Stream/Creek
NRCS Soil Map Unit
GaA: Garretson loam, gravel substratum, 0 to 2 percent slopes
GcD2: Gaviota loam, 5 to 15 percent slopes, eroded
Rg: Riverwash
VaE2: Vallecitos rocky loam, 15 to 30 percent slopes, eroded
VaG2: Vallecitos loam, 30 to 75 percent slopes, eroded, MLRA 15
N
0 300 600
Feet
Projection: CA State Plane III NAD83
Prepared: SCP 2023-12-13
Valley Water
AECOM
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Table 1 Soil Map Units That Occur in the Study Area According to the Soil Survey of Eastern Santa Clara Area, California and the Soil Survey of San Benito County, California

Name	Map Unit	Soil Series	Taxonomic Class	Description	Hydric?[1]
Cortina very gravelly loam, 0-5% slopes	456980	Cortina (85%)	Loamy-skeletal, mixed, superactive, nonacid, thermic Typic Xerofluvents	Very deep, somewhat excessively drained soils on alluvial fans and floodplains. These soils formed in gravelly alluvium from mixed rock sources. These soils are excessively drained with negligible to low runoff and rapid permeability.	Yes
		Minor Components (15%)		Minor components are riverwash (8%) and Garretson (7%)	Yes
Garretson loam, gravel substratum, 0-2% slopes	456990	Garretson (85%)	Fine-loamy, mixed, active, nonacid, thermic Typic Xerorthents	See above	No
		Minor Components (15%)		Minor components are Cortina (5%) and Unnamed (10%)	Yes
Gaviota gravelly loam, 30-75% slopes, severely eroded	456996	Gaviota (85%)	Loamy, mixed, superactive, nonacid, thermic Lithic Xerorthents	See above	No
		Minor Components (15%)		Minor components include Vallecitos (8%) and rock outcrop (7%)	No
Gaviota loam, 15-30% slopes	456993	Gaviota (85%)	Loamy, mixed, superactive, nonacid, thermic Lithic Xerorthents	See above	No
		Minor Components (15%)		Minor Components Vallecitos (10%) and Rock outcrop (5%)	No
Gaviota loam, 30-75% slopes	456996	Gaviota (85%)	Loamy, mixed, superactive, nonacid, thermic Lithic Xerorthents	See above	No
		Minor Components		Minor components are Vallecitos (8%) and Rock outcrop (7%)	No
Los Gatos-Gaviota complex, 50-75% slopes	457017	Los Gatos (60%)	Fine-loamy, mixed, active, mesic Typic Argixerolls	The Los Gatos series occur on mountain slopes and are formed from residuum weathered from shale and/or sandstone. These soils are well-drained with rapid to very rapid runoff and moderate permeability.	No
		Gaviota (25%)	Loamy, mixed, superactive, nonacid, thermic Lithic Xerorthents	See above	No

		Minor Components (15%)		Minor components are Rock outcrop (4%), Los Osos (4%), Altamont (4%), and Vallecitos (35)	No
Pleasanton gravelly loam, 9-15% slopes, eroded	457041	(85%)	Fine-loamy, mixed, superactive, thermic Mollic Haploxeralfs	See above	No
		Minor Components (15%)		Minor Components are 3% Hilltop and 12% Unnamed	Unknow n
Riverwash	457044	Riverwash (100%)	—	Riverwash occurs on floodplains in major streams and their tributaries. Riverwash consists of recent depositions of gravel, sand, and silt alluvium and are subject to frequent flooding.	Yes
Rock land	457045	Rock land (45%)	—	Rockland occurs on mountain slopes and backslopes and is excessively drained.	No
		Lythic Xerothents (45%)	—	Lythic xerothents occurs on mountain slopes and backslopes and are excessively drained.	No
		Minor Componetns (10%)	—	Minor Components are Gaviota (4%), Vallecitos (3%), and Montara (3%)	Yes
Vallecitos loam, 30-75% slopes, eroded	457062	Valecitos (80%)	Clayey, smectitic, thermic Lithic Ruptic-Inceptic Haploxeralfs	See above	No
		Minor Components (20%)		Minor components are rock outcrop (10%), Los Osos (3%), Henneke (3%), Los Gatos (3%), and Gaviota (1%).	Yes
Vallecitos rocky loam, 15-30% slopes, eroded	457061	Vallecitos (85%)	Clayey, smectitic, thermic Lithic Ruptic-Inceptic Haploxeralfs	See above	No
		Minor Components (15%)		Minor components are rock outcrop (10%), Gaviota (3%), and Montara (2%)	Yes

[1] *P* A value of Yes in the Hydric column for minor components means that one or more of the minor components are hydric.

*P*Source: NRCS 2020a, NRCS 2020b

Appendix D: Biological Resources

Pacheco Reservoir Expansion Project Design Level Geotechnical Investigations

Attachment 3 - Aquatic Resources Delineation

Exhibit 3D. Waters of United States

Potential Waters of the US Resources Table

for
Design Level Geotechnical Investigations for the
Pacheco Reservoir Expansion Project

Potential Waters	Feature Label	Area (acre)
Reservoir	Pacheco Reservoir	6.486
	Reservoir Subtotal:	**6.486**
Riverine Intermittent	North Fork Pacheco Creek	0.014
Riverine Intermittent	RVI-32	0.079
	Riverine Intermittent Subtotal:	**0.093**
	Total Potential Other Waters:	**6.579**

Potential Wetland	Feature Label	Area (acre)
Riparian Wetland	RWD-2	0.003
Riparian Wetland	RWD-24	0.004
	Riparian Wetland:	**0.007**
Seasonal Wetland	SWD-21	0.082
Seasonal Wetland	SWD-23	0.202
Seasonal Wetland	SWD-24	0.350
Seasonal Wetland	SWD-25	0.217
Seasonal Wetland	SWD-26	0.165
Seasonal Wetland	SWD-28	0.215
Seasonal Wetland	SWD-29	0.083
Seasonal Wetland	SWD-31	0.714
Seasonal Wetland	SWD-32	0.529
Seasonal Wetland	SWD-33	0.001
Seasonal Wetland	SWD-39	0.205
Seasonal Wetland	SWD-41	0.092
Seasonal Wetland	SWD-43	0.015
	Seasonal Wetland Subtotal:	**2.870**
	Total Potential Wetlands:	**2.877**

Valley Water

AECOM
Stantec GEI

Projection: CA State Plane III NAD83
Prepared: SCP 2023-12-13

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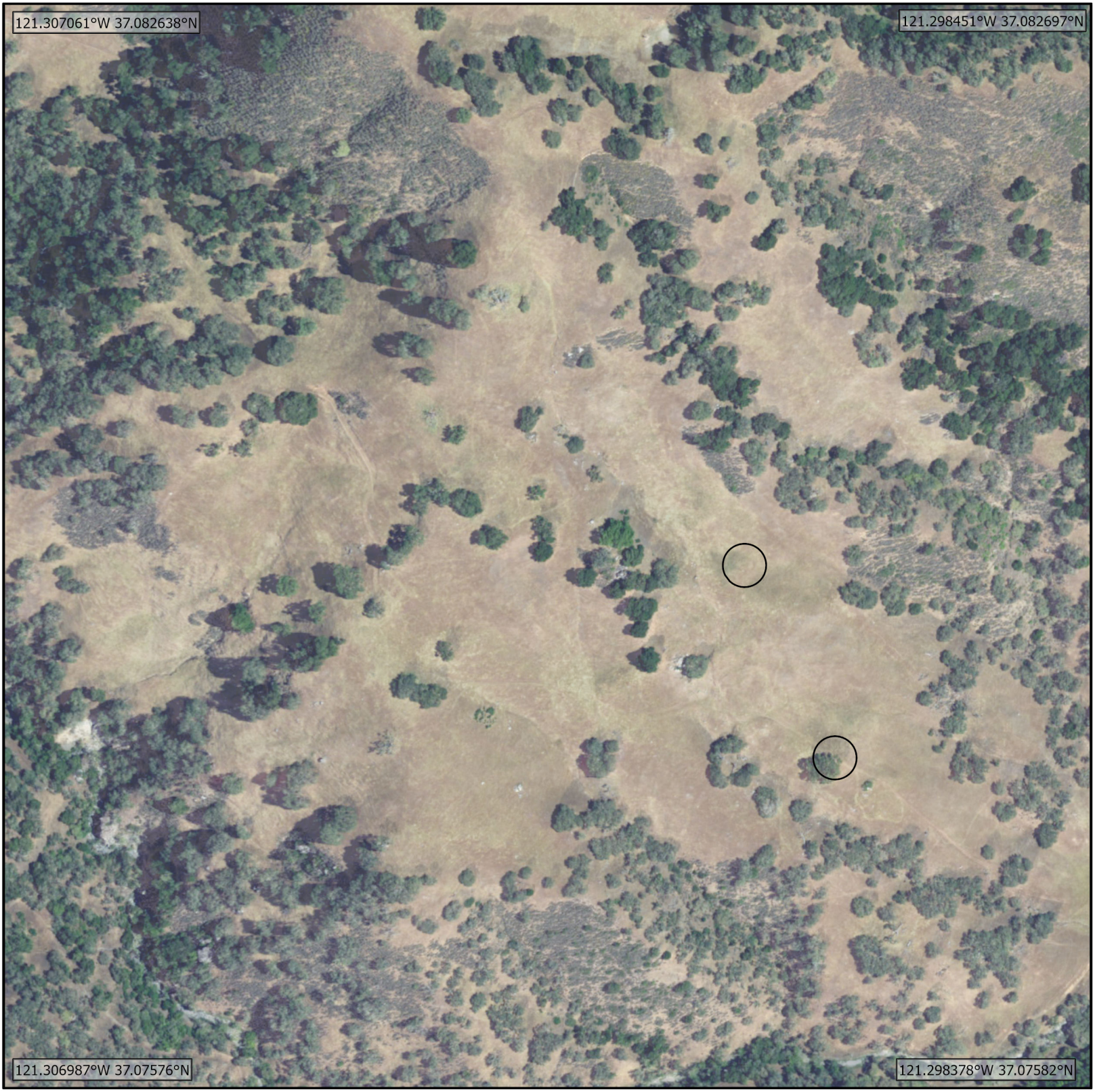

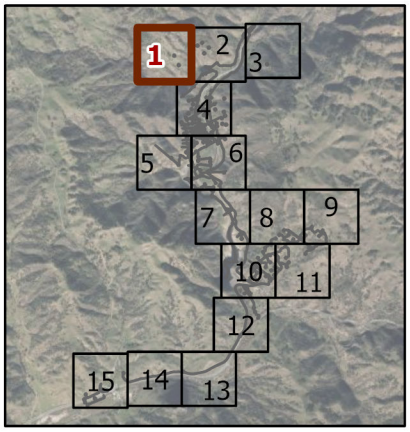

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

Study Area

N

0 150 300 Feet

Projection: CA State Plane III NAD83
Prepared: SCP 2024-05-15

Valley Water

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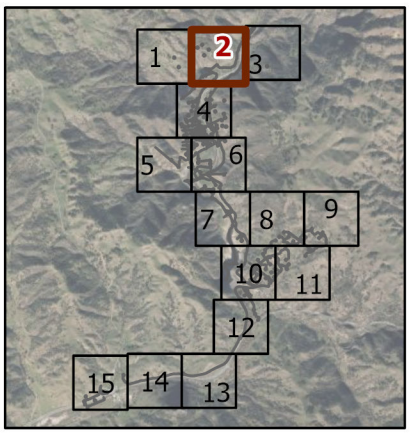

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

- Study Area
- Top of Bank/Reservoir Full Pool Line
- Pacheco Reservoir Ordinary High Water Mark (OHWM)
- Stream/Creek

Potential Waters of the US Outside of the Study Area

- Reservoir
- Riverine Intermittent

N

0 150 300 Feet

Projection: CA State Plane III NAD83
Prepared: SCP 2024-05-15

Valley Water

AECOM

Stantec GEI

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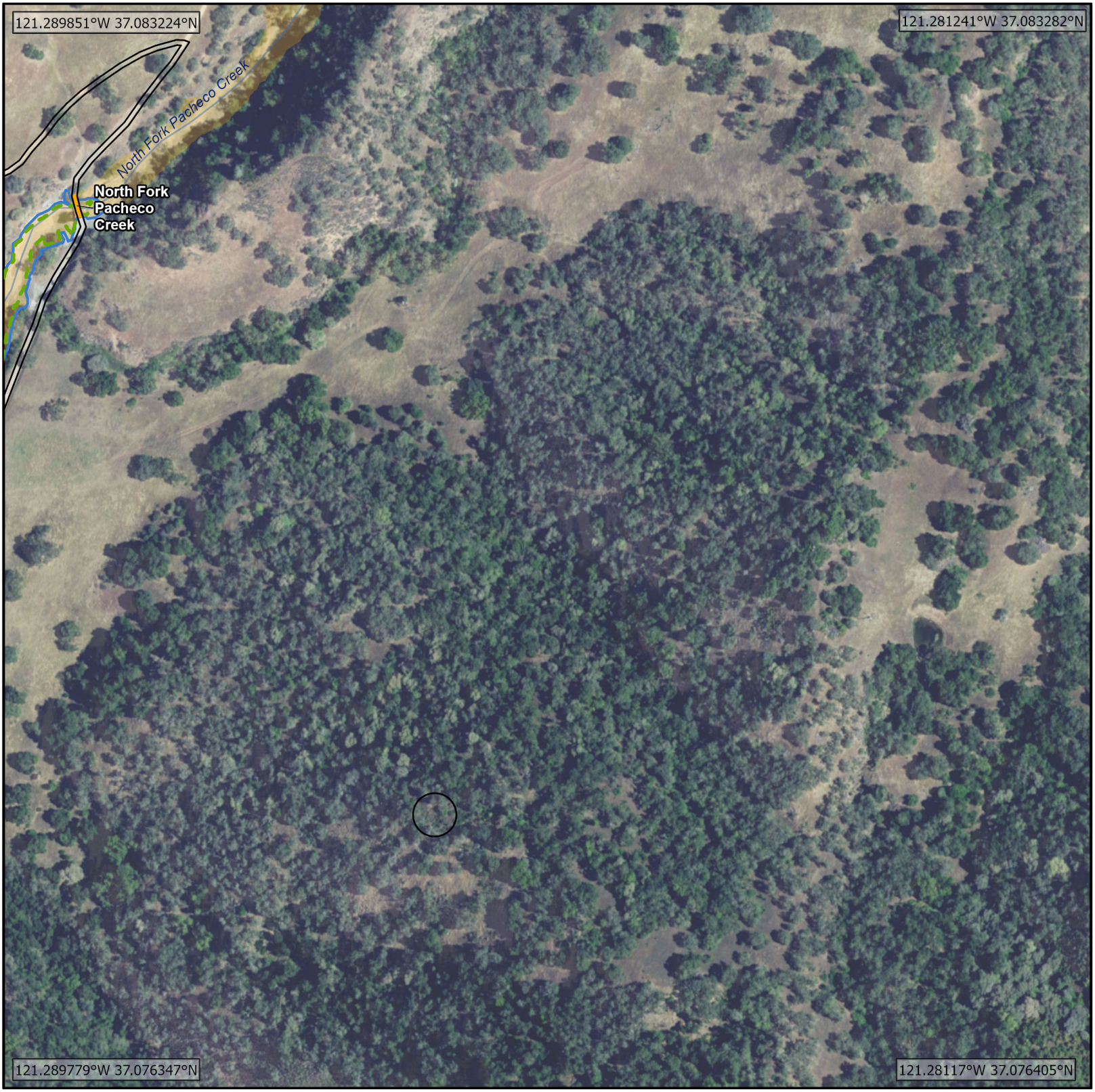

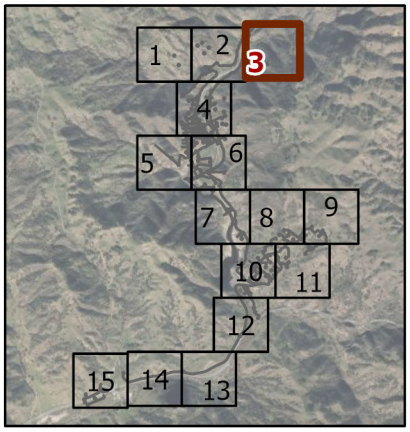

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

- Study Area
- Top of Bank/Reservoir Full Pool Line
- Pacheco Reservoir Ordinary High Water Mark (OHWM)
- Stream/Creek

Potential Waters of the US

- Riverine Intermittent

N

0 150 300 Feet

Projection: CA State Plane III NAD83
Prepared: SCP 2024-05-15

Valley Water

AECOM
Stantec GEI

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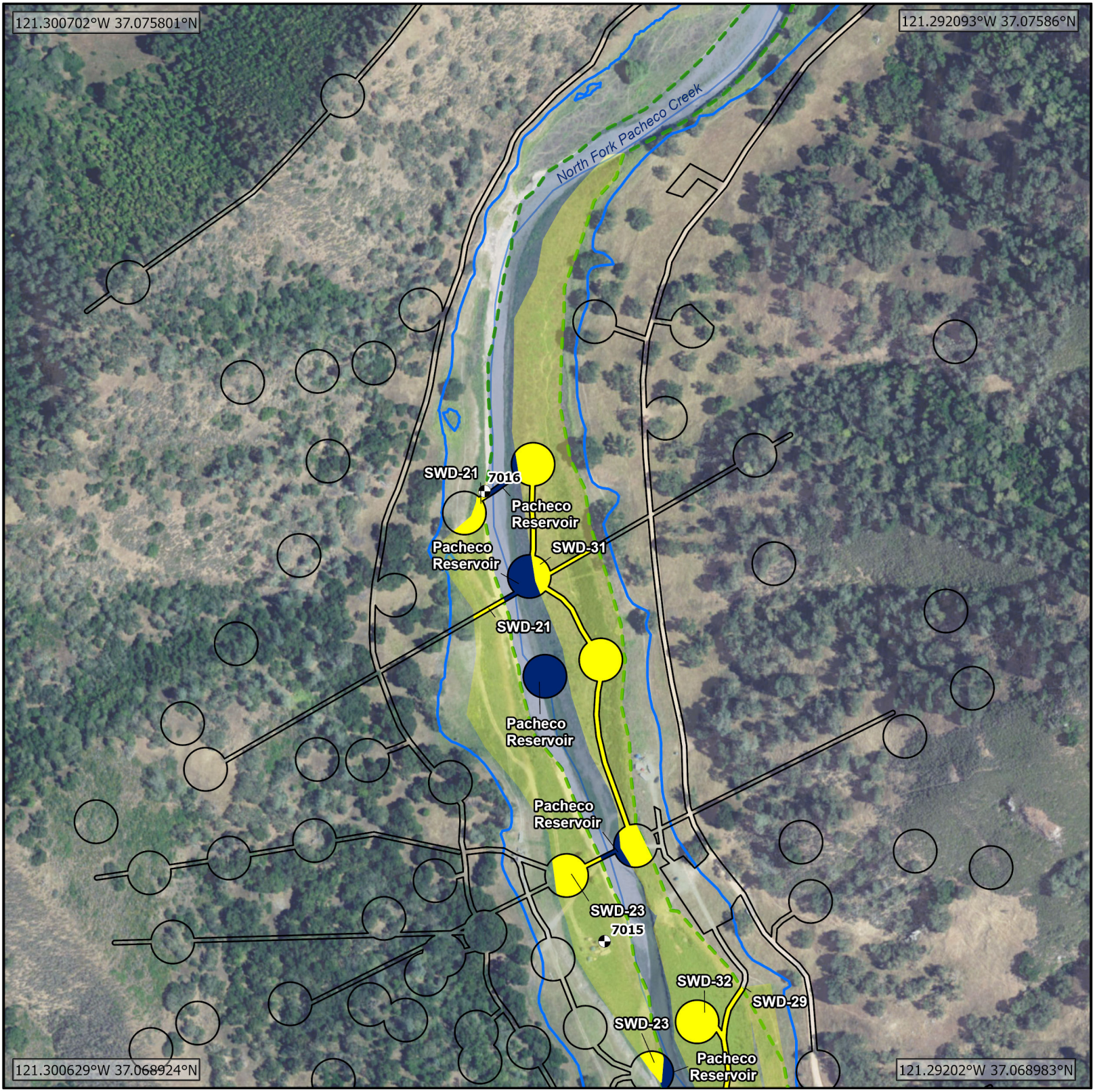

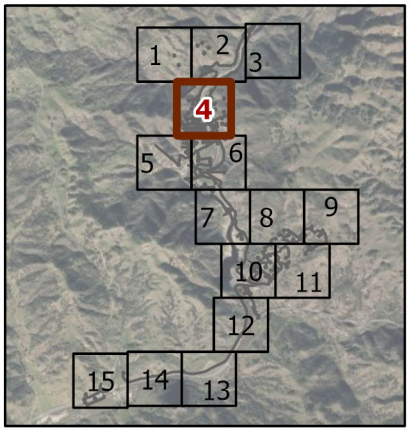

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

- Study Area
- Top of Bank/Reservoir Full Pool Line
- Pacheco Reservoir Ordinary High Water Mark (OHWM)
- Data Points
- Stream/Creek

Potential Waters of the US

- Reservoir
- Seasonal Wetland

N

0 150 300 Feet

Projection: CA State Plane III NAD83
Prepared: SCP 2024-05-15

Valley Water

AECOM
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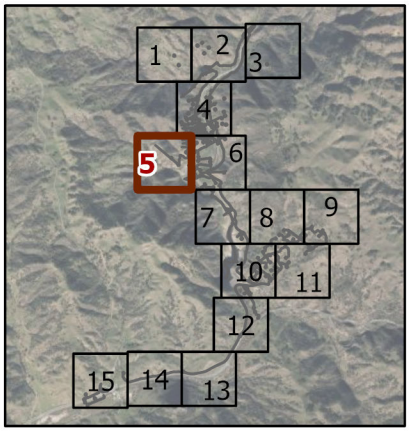

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

Study Area

Top of Bank/Reservoir Full Pool Line

Pacheco Reservoir Ordinary High Water Mark (OHWM)

Potential Waters of the US

Reservoir

Seasonal Wetland

N

0 150 300 Feet

Projection: CA State Plane III NAD83
Prepared: SCP 2024-05-15

Valley Water

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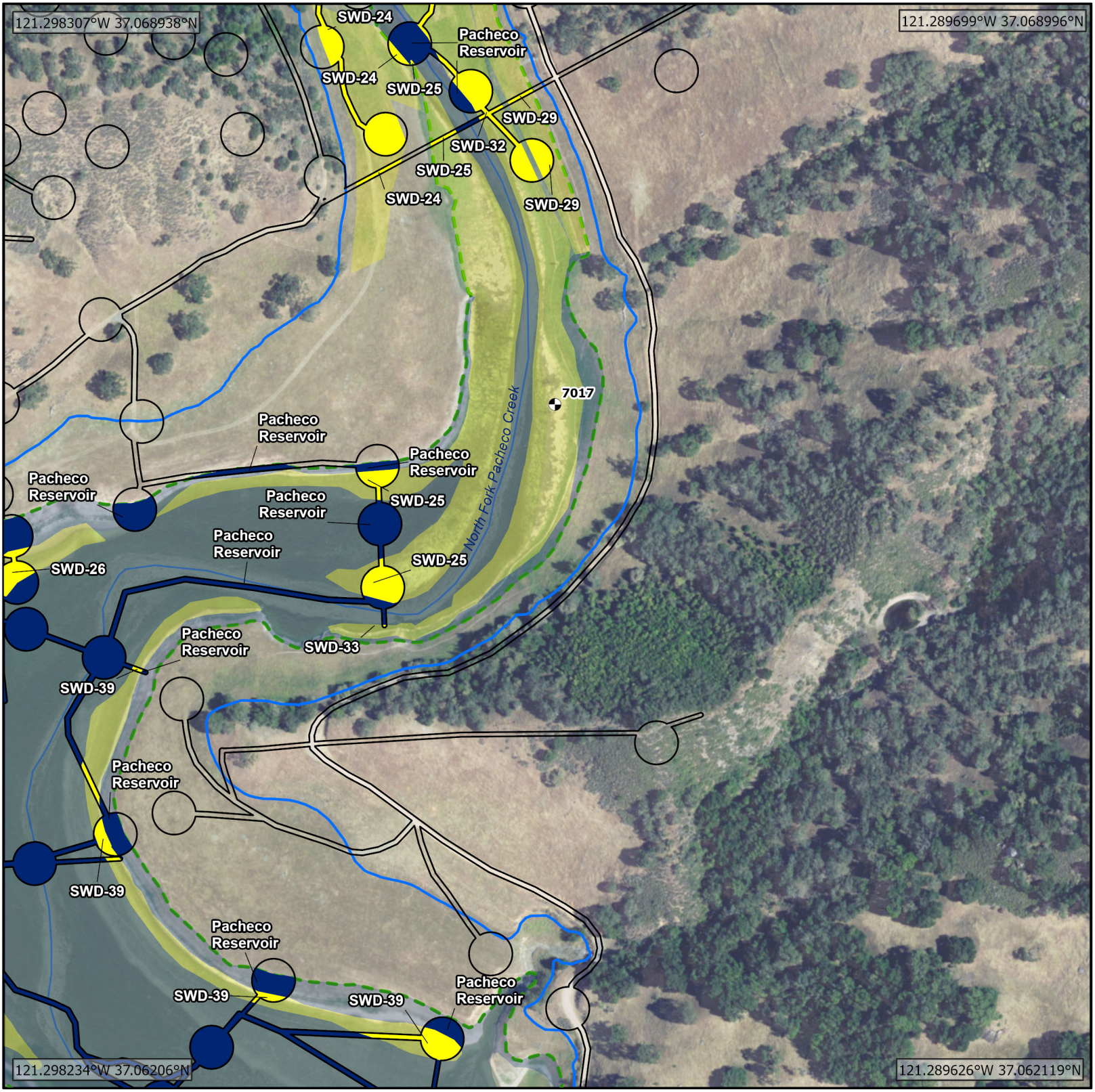

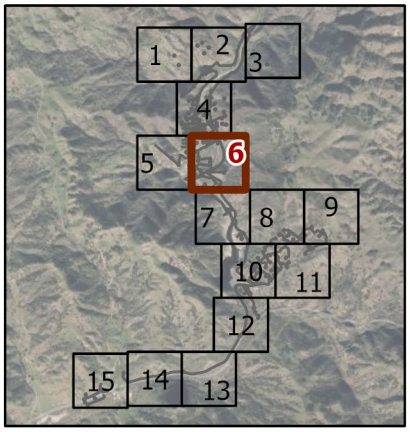

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

- Study Area
- Top of Bank/Reservoir Full Pool Line
- Pacheco Reservoir Ordinary High Water Mark (OHWM)
- Data Points
- Stream/Creek

Potential Waters of the US

- Reservoir
- Seasonal Wetland

N

0 150 300 Feet

Projection: CA State Plane III NAD83
Prepared: SCP 2024-05-15

Valley Water

AECOM
Stantec GEI

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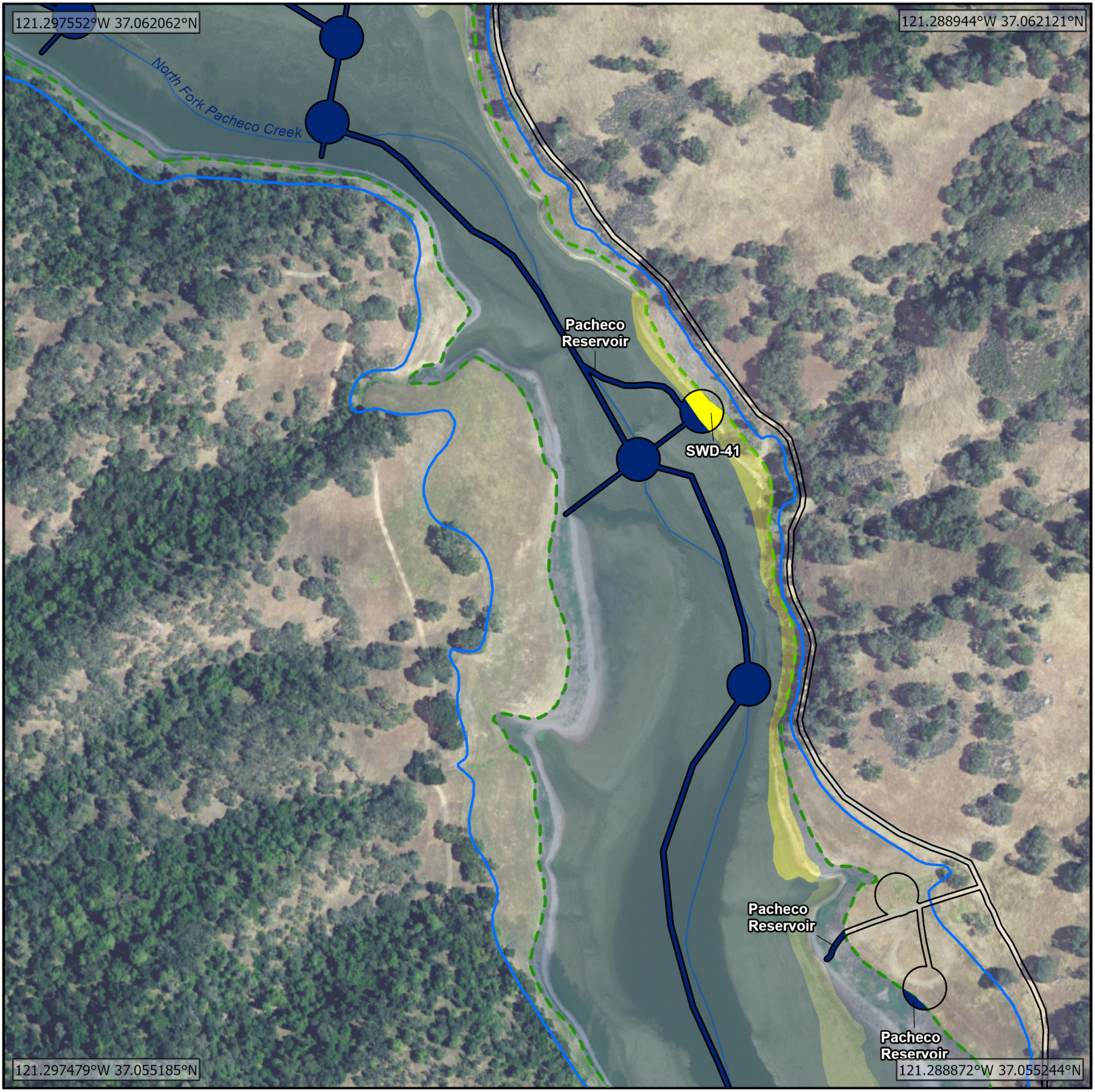

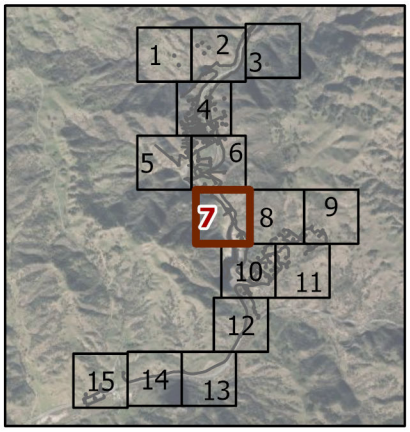

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

- Study Area
- Top of Bank/Reservoir Full Pool Line
- Pacheco Reservoir Ordinary High Water Mark (OHWM)
- Stream/Creek

Potential Waters of the US

- Reservoir
- Seasonal Wetland

N

0 150 300 Feet

Projection: CA State Plane III NAD83
Prepared: SCP 2024-05-15

Valley Water

AECOM

Stantec GEI

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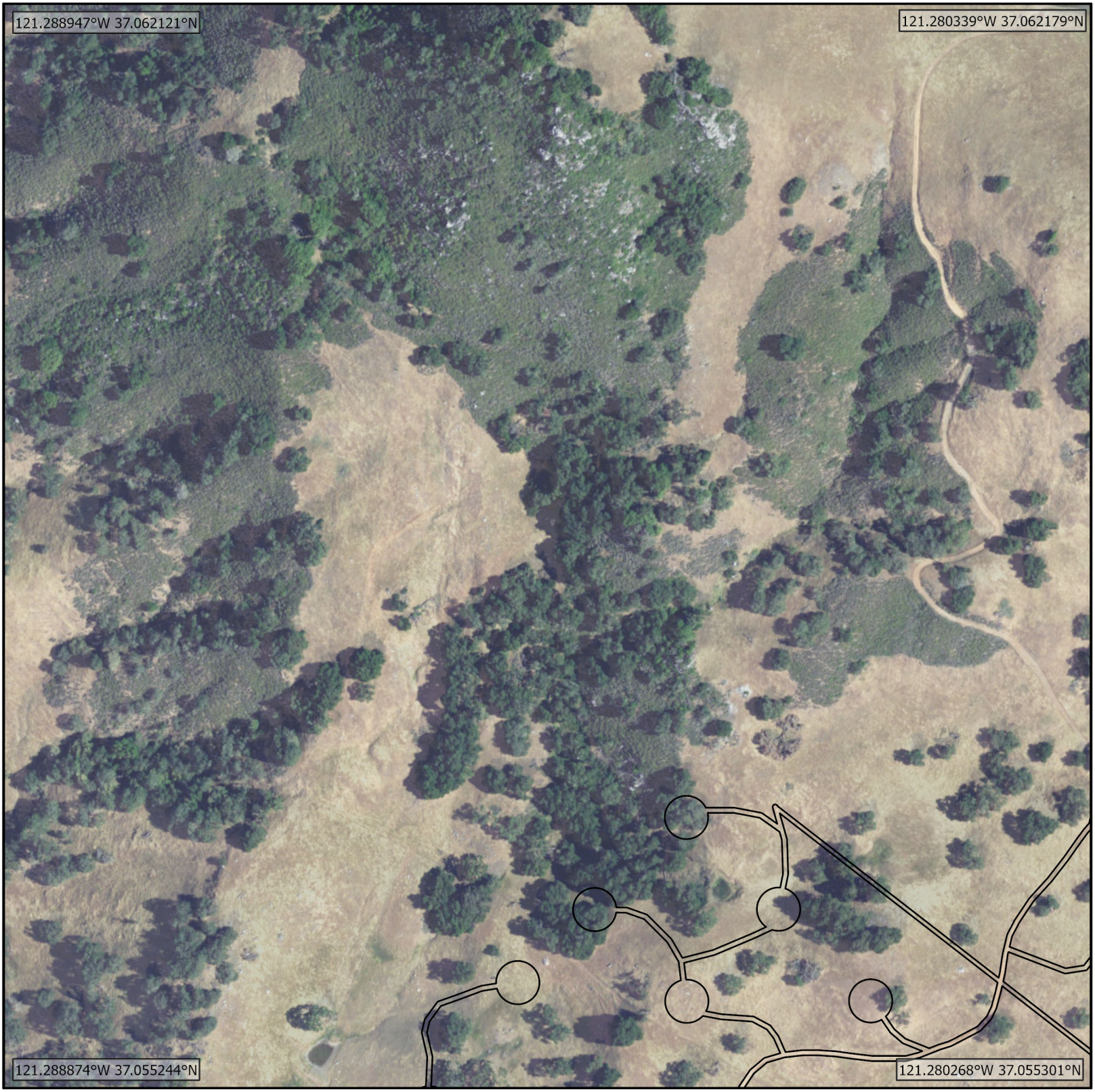

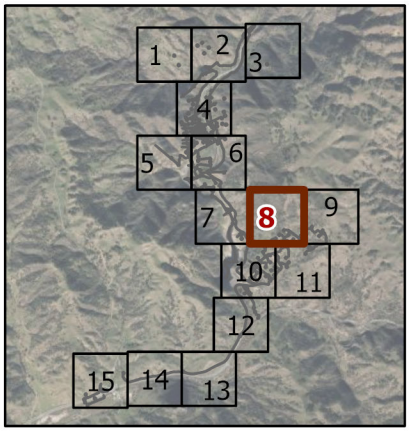

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

Study Area

N

0 150 300 Feet

Projection: CA State Plane III NAD83
Prepared: SCP 2024-05-15

Valley Water

AECOM
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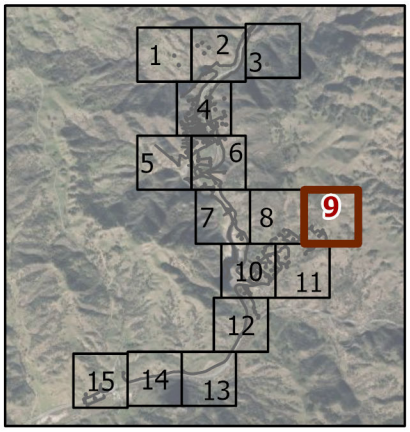

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

Study Area

N

0 150 300 Feet

Projection: CA State Plane III NAD83
Prepared: SCP 2024-05-15

Valley Water

AECOM

Stantec GEI

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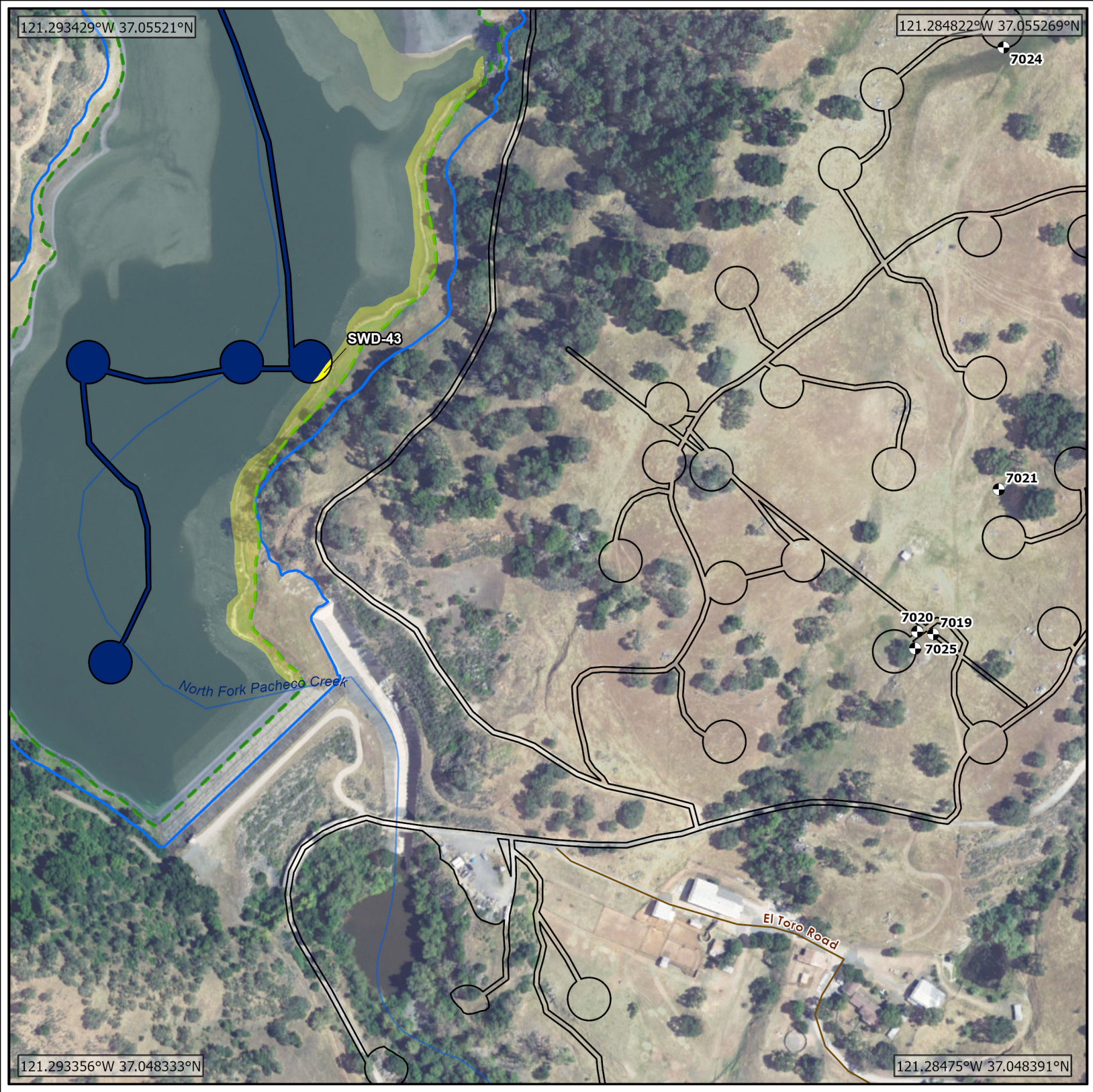

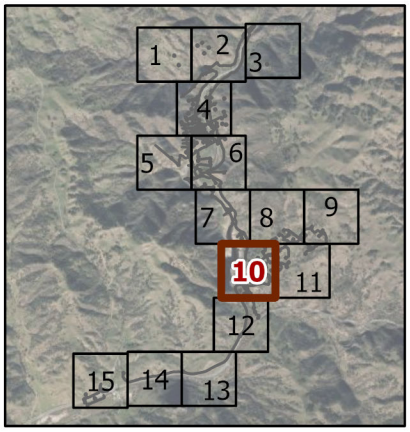

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

- Study Area
- Top of Bank/Reservoir Full Pool Line
- Pacheco Reservoir Ordinary High Water Mark (OHWM)
- Data Points
- Roads
- Stream/Creek

Potential Waters of the US

- Reservoir
- Seasonal Wetland

N

0 150 300 Feet

Projection: CA State Plane III NAD83
Prepared: SCP 2024-05-15

Valley Water

AECOM

Stantec GEI

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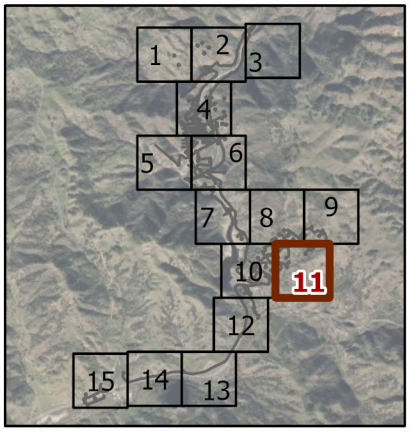

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

Study Area

N

0 150 300 Feet

Projection: CA State Plane III NAD83
Prepared: SCP 2024-05-15

Valley Water

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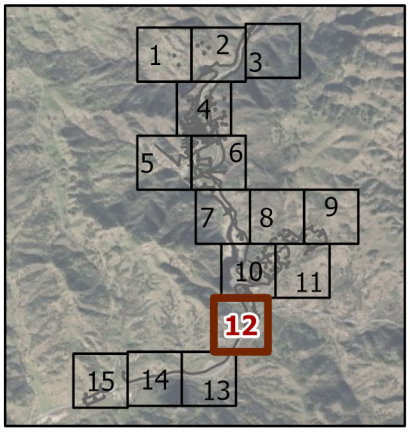

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

- Study Area
- Roads
- Major Highway
- Stream/Creek

Potential Waters of the US

- Riverine Intermittent

N

0 150 300 Feet

Projection: CA State Plane III NAD83
Prepared: SCP 2024-05-15

Valley Water

AECOM

Stantec GEI

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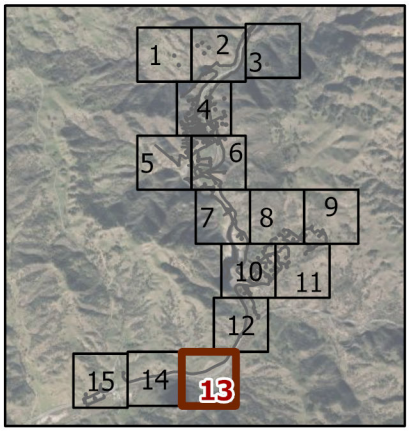

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

- Study Area
- Major Highway
- Stream/Creek

N

0 150 300 Feet

Projection: CA State Plane III NAD83
Prepared: SCP 2024-05-15

Valley Water

AECOM

Stantec GEI

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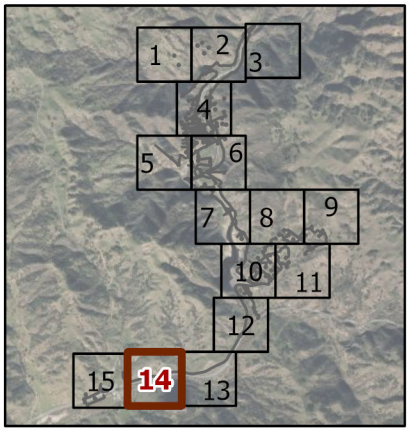

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

- Study Area
- Major Highway
- Stream/Creek

N

0 150 300 Feet

Projection: CA State Plane III NAD83
Prepared: SCP 2024-05-15

Valley Water

AECOM

Stantec GEI

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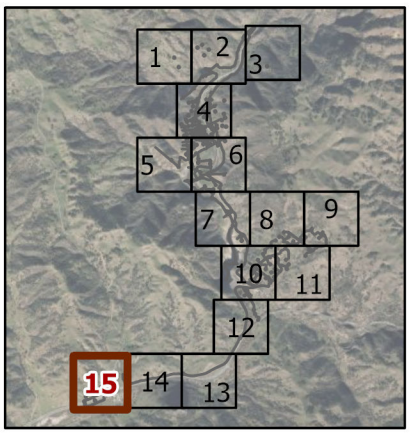

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

- Study Area
- Roads
- Major Highway
- Stream/Creek

N

0 150 300 Feet

Projection: CA State Plane III NAD83
Prepared: SCP 2024-05-15

Valley Water

AECOM

Stantec GEI

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Appendix D: Biological Resources

Pacheco Reservoir Expansion Project Design Level Geotechnical Investigations

Attachment 3 - Aquatic Resources Delineation

Exhibit 3E. Waters of State

Potential Waters of the State Resources Table

for
Design Level Geotechnical Investigations for the
Pacheco Reservoir Expansion Project

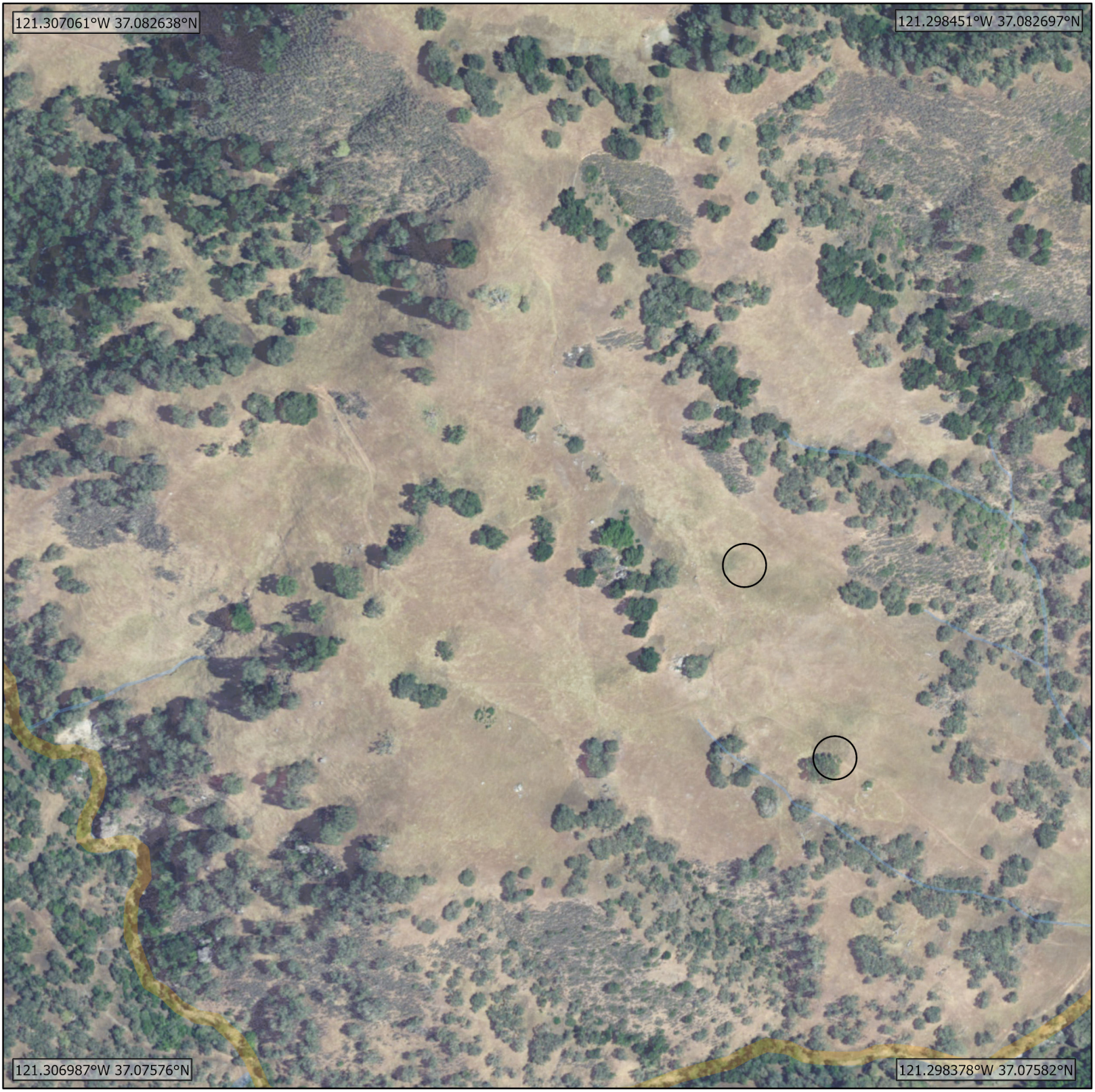
Potential Waters	Feature Label	Area (acre)
Reservoir	Pacheco Reservoir	6.467
	Reservoir Subtotal:	**6.467**
Riverine Ephemeral	RVE-209	0.001
Riverine Ephemeral	RVE-210	0.001
Riverine Ephemeral	RVE-215	0.001
Riverine Ephemeral	RVE-217	0.001
Riverine Ephemeral	RVE-219	0.009
Riverine Ephemeral	RVE-221	0.001
Riverine Ephemeral	RVE-226	0.001
Riverine Ephemeral	RVE-227	< 0.001
Riverine Ephemeral	RVE-230	0.001
Riverine Ephemeral	RVE-246	< 0.001
Riverine Ephemeral	RVE-247	0.001
Riverine Ephemeral	RVE-248	0.001
Riverine Ephemeral	RVE-279	0.001
Riverine Ephemeral	RVE-291	0.001
Riverine Ephemeral	RVE-311	0.001
Riverine Ephemeral	RVE_001a	0.003
Riverine Ephemeral	RVE_001b	0.093
Riverine Ephemeral	RVE_015c	0.001
	Riverine Ephemeral Subtotal:	**0.118**
Riverine Intermittent	North Fork Pacheco Creek	0.014
Riverine Intermittent	RVI-30	0.001
Riverine Intermittent	RVI-31	0.003
Riverine Intermittent	RVI-32	0.017
Riverine Intermittent	RVI-33	< 0.001
Riverine Intermittent	RVI-34	0.003
Riverine Intermittent	RVI-40	0.014
Riverine Intermittent	RVI-42	0.002
	Riverine Intermittent Subtotal:	**0.054**
	Total Potential Other Waters:	**6.639**

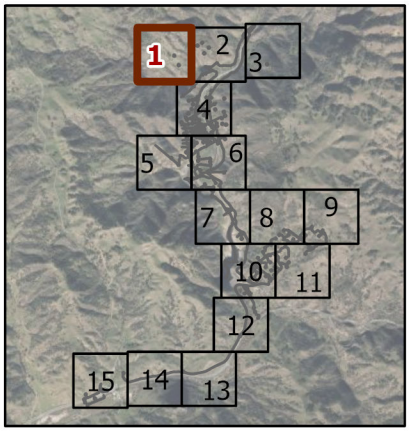
Potential Wetland	Feature Label	Area (acre)
Seasonal Wetland	SWD-21	0.082
Seasonal Wetland	SWD-23	0.202
Seasonal Wetland	SWD-24	0.35
Seasonal Wetland	SWD-25	0.236
Seasonal Wetland	SWD-26	0.156
Seasonal Wetland	SWD-28	0.158
Seasonal Wetland	SWD-29	0.083
Seasonal Wetland	SWD-31	0.714
Seasonal Wetland	SWD-32	0.529
Seasonal Wetland	SWD-33	0.001
Seasonal Wetland	SWD-39	0.234
Seasonal Wetland	SWD-41	0.092
Seasonal Wetland	SWD-43	0.015
Seasonal Wetland	SWD-44	0.003
Seasonal Wetland	SWD-45	0.034
Seasonal Wetland	SWD-48	0.043
Seasonal Wetland	SWD-49	0.007
Seasonal Wetland	SWD-51	0.054
Seasonal Wetland	SWD-72	0.024
	Seasonal Wetland Subtotal:	**3.017**
	Total Potential Wetlands:	**3.017**

Valley Water

AECOM
Stantec GEI

Projection: CA State Plane III NAD83
Prepared: SCP 2024-05-17





Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

Study Area

Major Highway

Potential Waters of the State Outside of the Study Area

Riverine Ephemeral

Riverine Intermittent

N

0 150 300 Feet

Projection: CA State Plane III NAD83
Prepared: SCP 2024-05-15

Valley Water

AECOM

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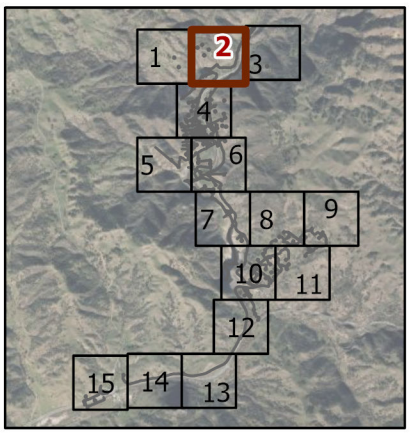

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

- Study Area
- Top of Bank/Reservoir Full Pool Line
- Pacheco Reservoir Ordinary High Water Mark (OHWM)
- Data Points
- Major Highway
- Stream/Creek

Potential Waters of the State

- Riverine Ephemeral
- Riverine Intermittent

Potential Waters of the State Outside of the Study Area

- Reservoir
- Seasonal Wetland

N

0 150 300 Feet

Projection: CA State Plane III NAD83
Prepared: SCP 2024-05-15

Valley Water

AECOM

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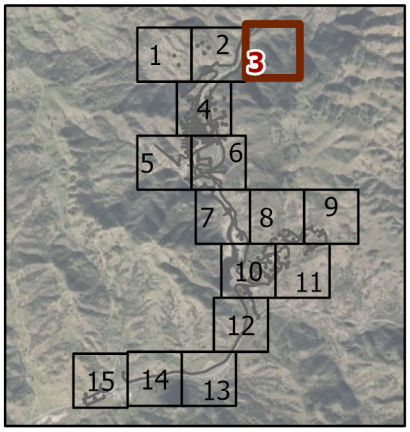

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

- Study Area
- Top of Bank/Reservoir Full Pool Line
- Pacheco Reservoir Ordinary High Water Mark (OHWM)
- Study Area - Reservoir above OHWM
- Data Points
- Major Highway
- Stream/Creek

Potential Waters of the State

- Riverine Ephemeral
- Riverine Intermittent

Potential Waters of the State Outside of the Study Area

- Seasonal Wetland

N

0 150 300 Feet

Projection: CA State Plane III NAD83
Prepared: SCP 2024-05-15

Valley Water

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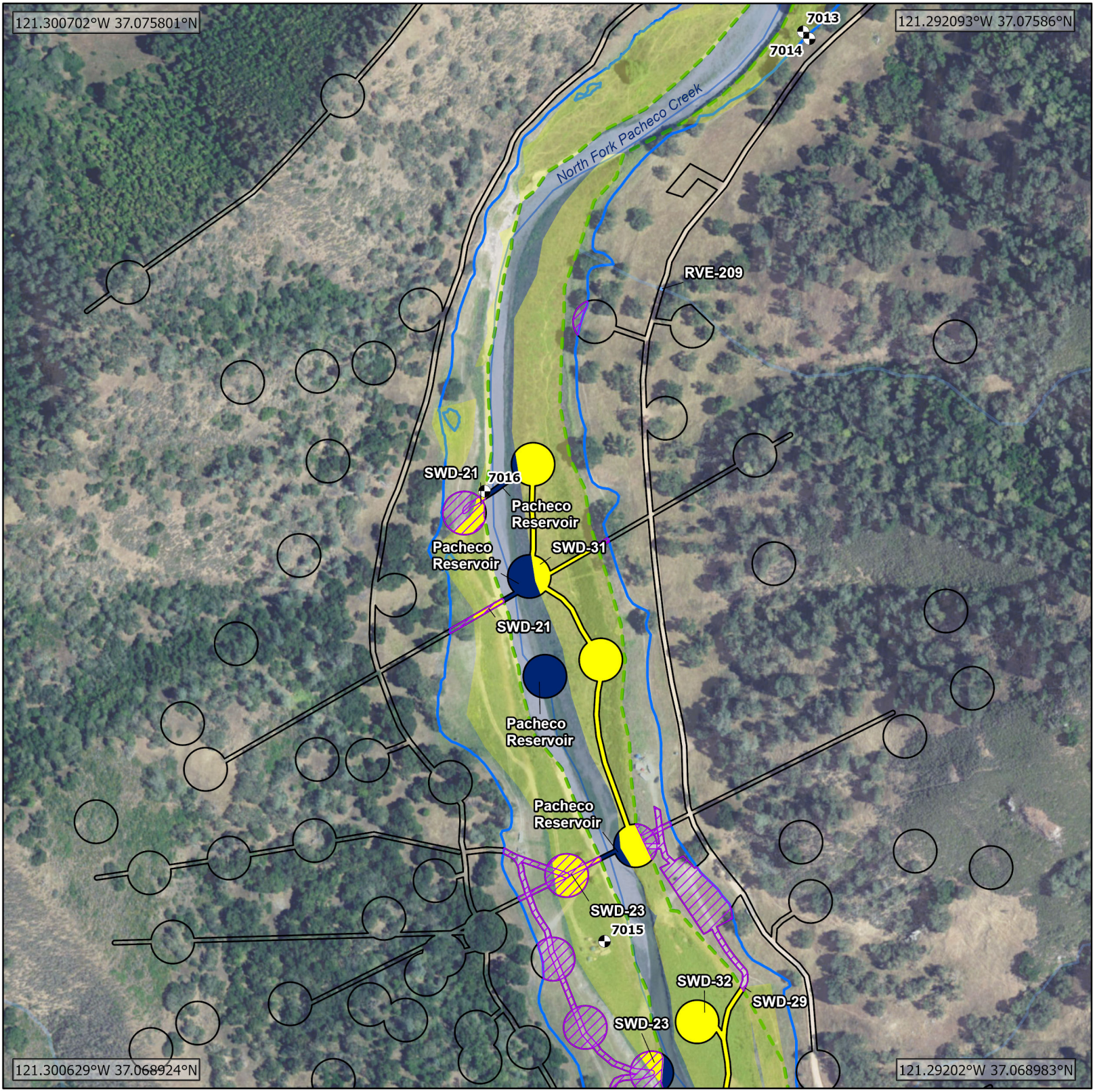

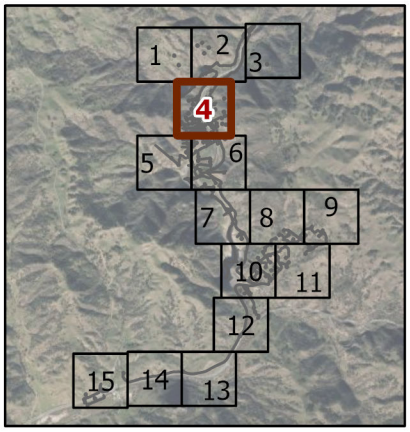

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

- Study Area
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- Study Area - Reservoir above OHWM
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- Riverine Ephemeral
- Seasonal Wetland

N

0 150 300 Feet

Projection: CA State Plane III NAD83
Prepared: SCP 2024-05-15

Valley Water

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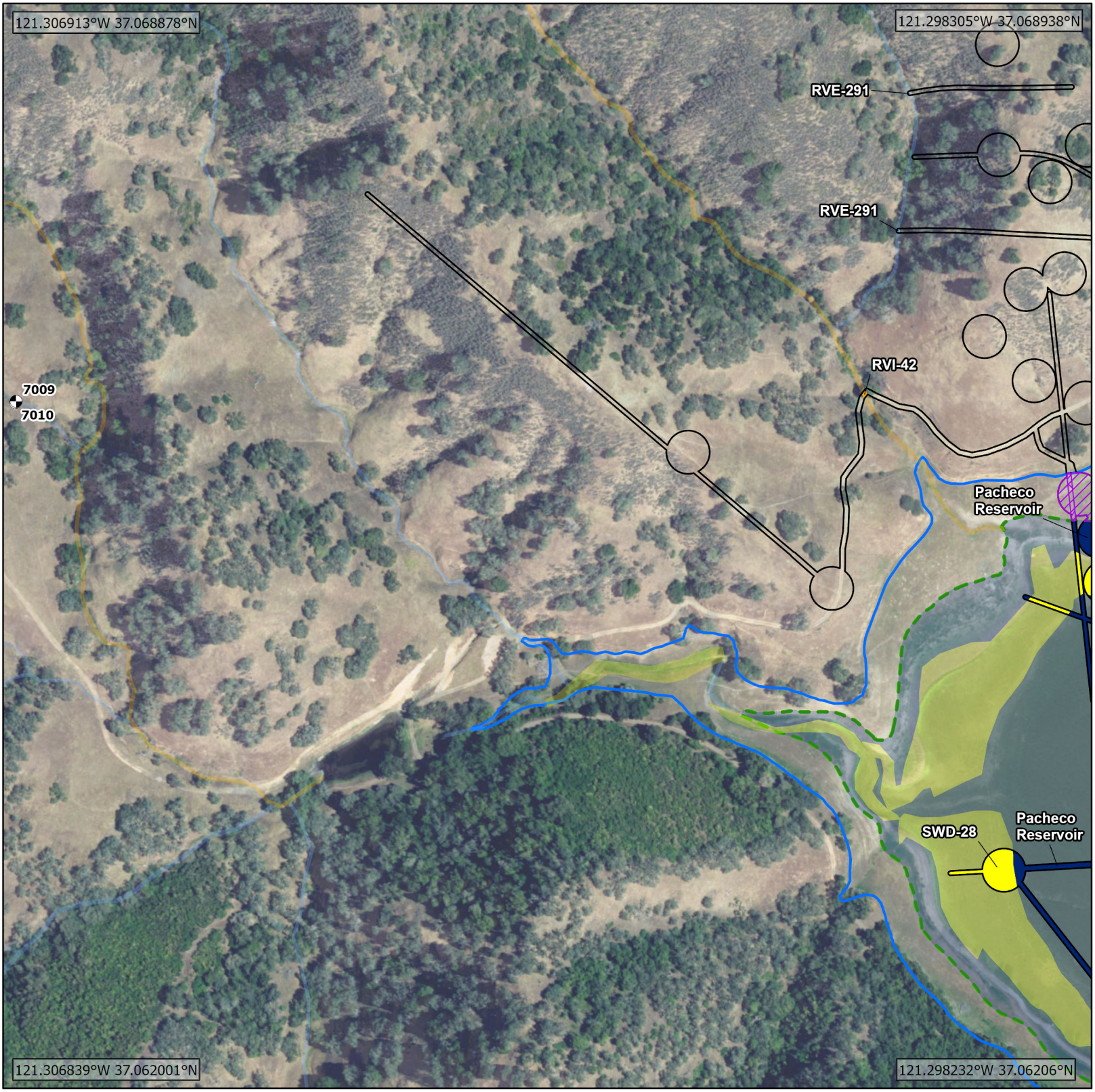

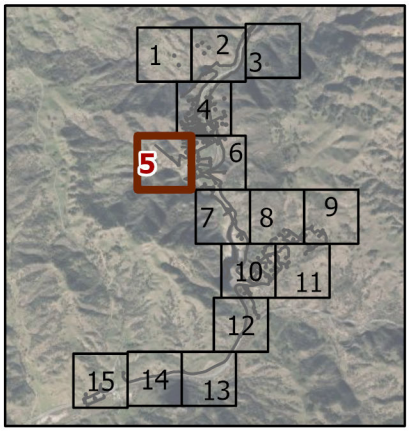

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

- Study Area
- Top of Bank/Reservoir Full Pool Line
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- Study Area - Reservoir above OHWM
- Data Points
- Major Highway

Potential Waters of the State

- Reservoir
- Riverine Ephemeral
- Riverine Intermittent
- Seasonal Wetland

N

0 150 300 Feet

Projection: CA State Plane III NAD83
Prepared: SCP 2024-05-15

Valley Water

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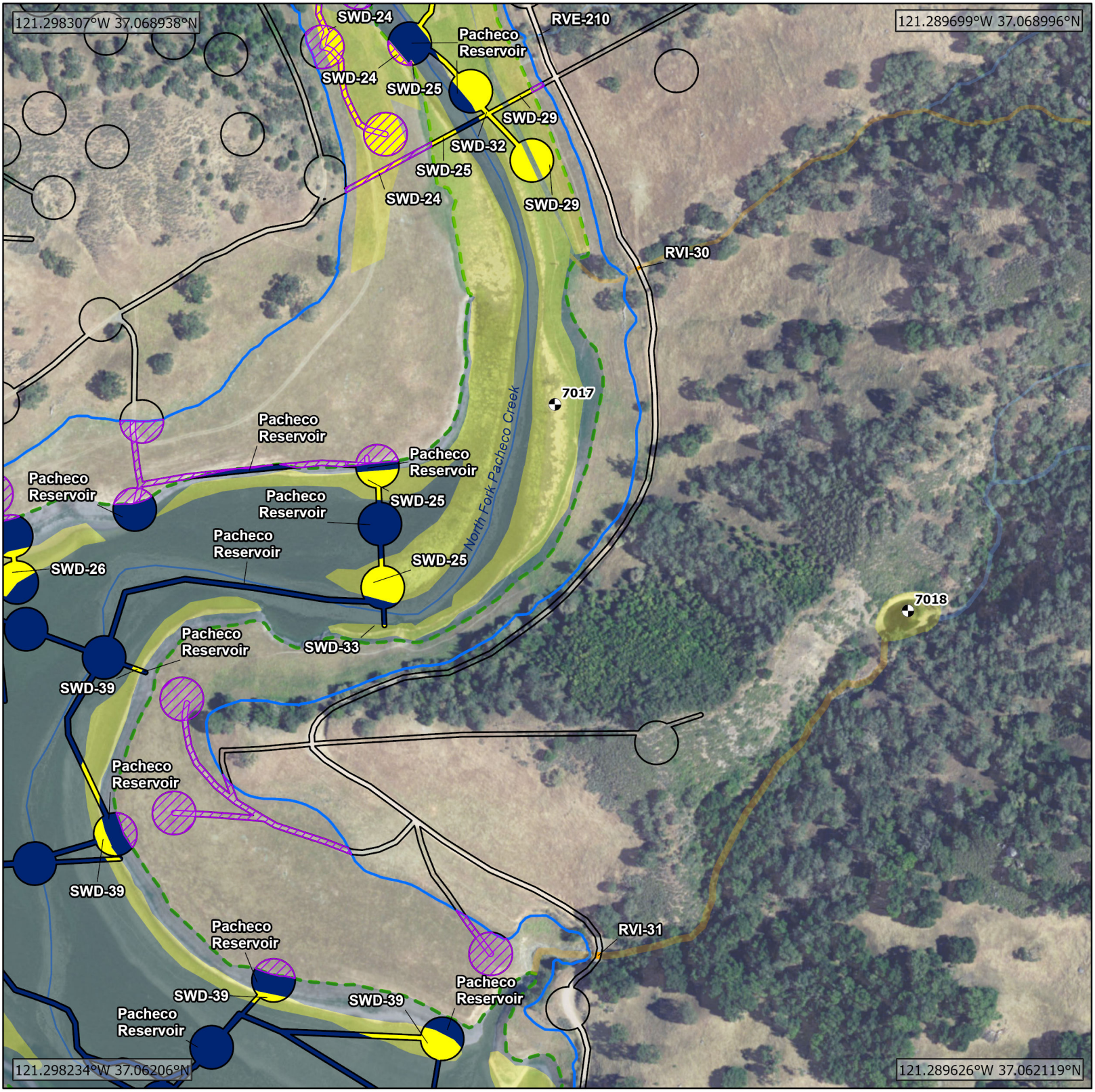

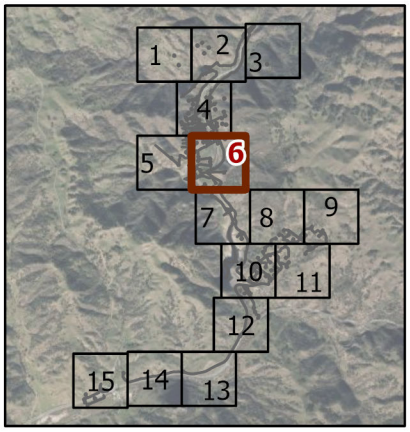

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

- Study Area
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- Study Area - Reservoir above OHWM
- Data Points
- Major Highway
- Stream/Creek

Potential Waters of the State

- Reservoir
- Riverine Ephemeral
- Riverine Intermittent
- Seasonal Wetland

N

0 150 300 Feet

Projection: CA State Plane III NAD83
Prepared: SCP 2024-05-15

Valley Water

AECOM

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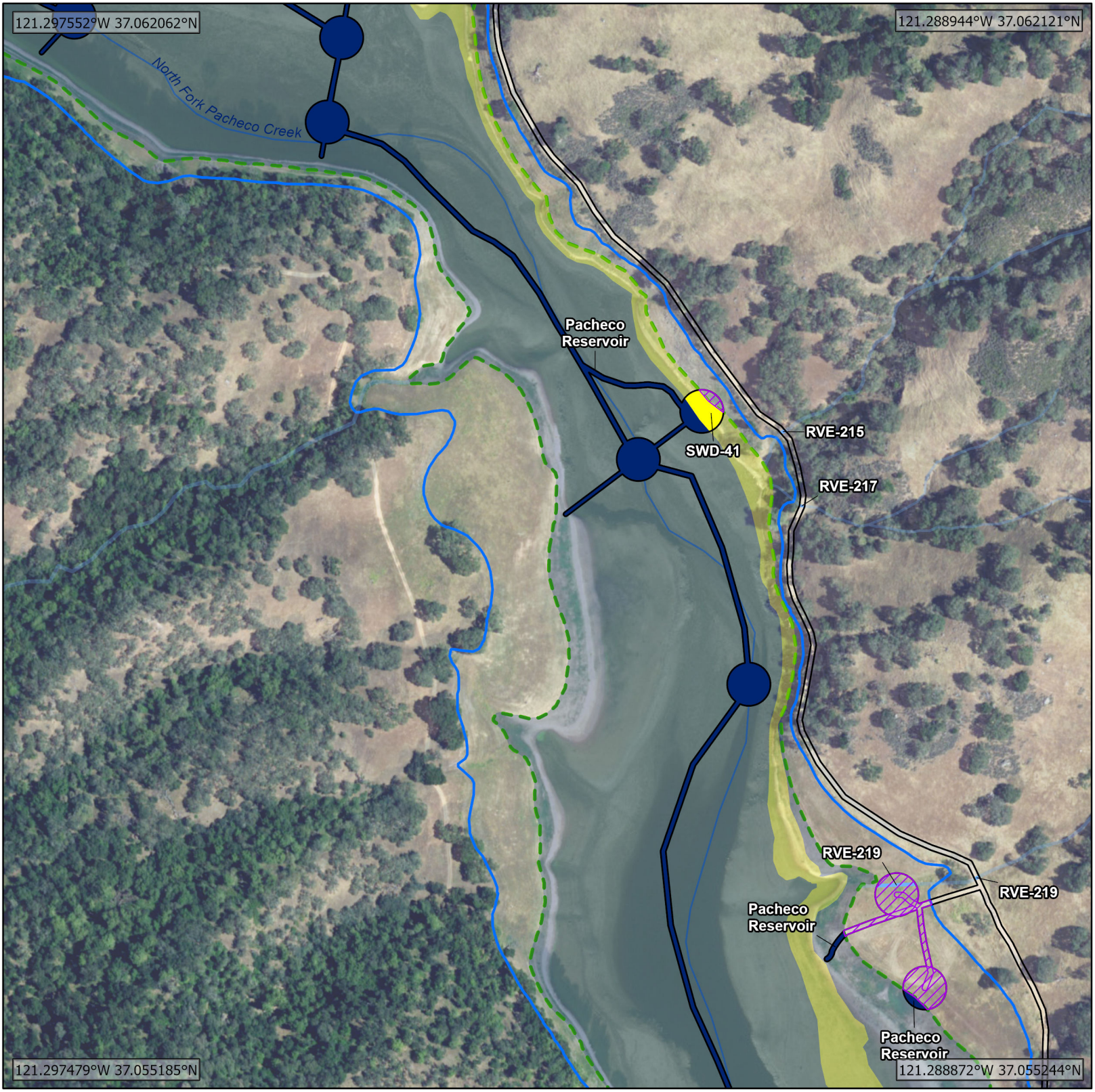

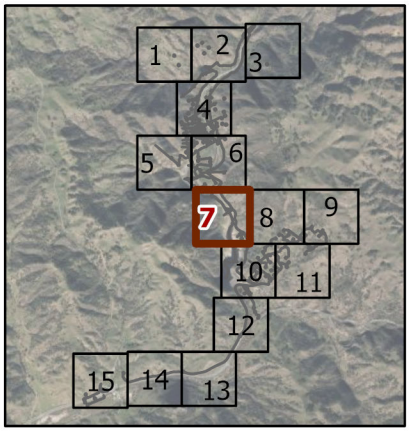

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

- Study Area
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- Major Highway
- Stream/Creek

Potential Waters of the State

- Reservoir
- Riverine Ephemeral
- Seasonal Wetland

N

0 150 300 Feet

Projection: CA State Plane III NAD83
Prepared: SCP 2024-05-15

Valley Water

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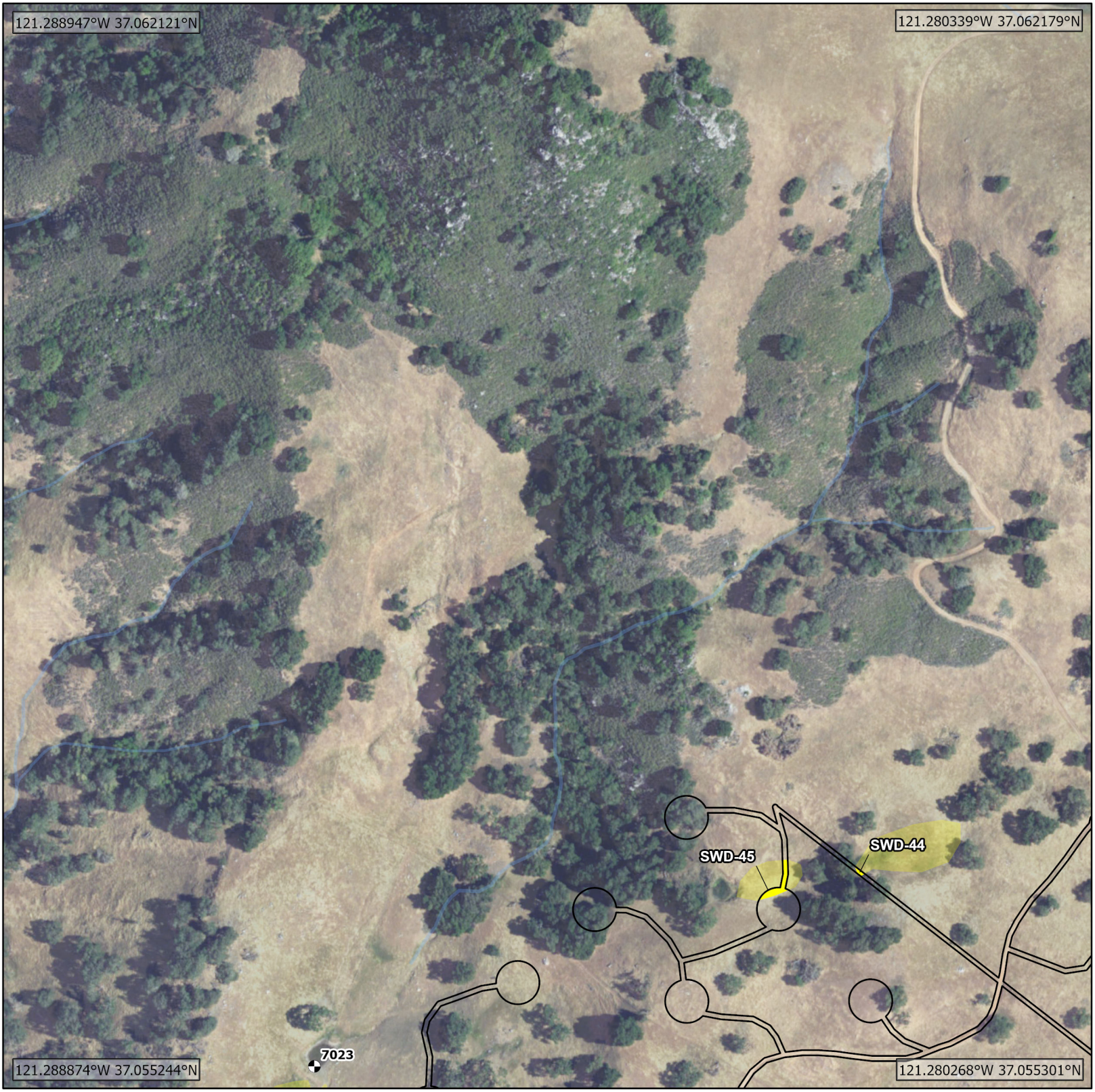

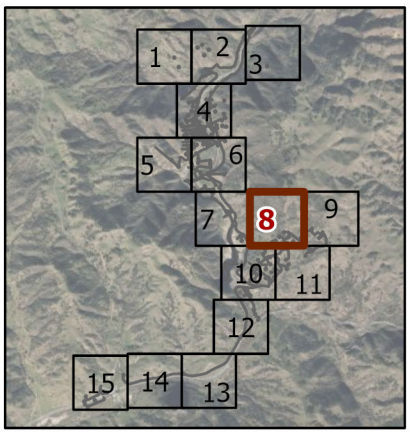

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

- Study Area
- Data Points
- Major Highway

Potential Waters of the State

- Seasonal Wetland

Potential Waters of the State Outside of the Study Area

- Riverine Ephemeral

N

0 150 300 Feet

Projection: CA State Plane III NAD83
Prepared: SCP 2024-05-15

Valley Water

AECOM

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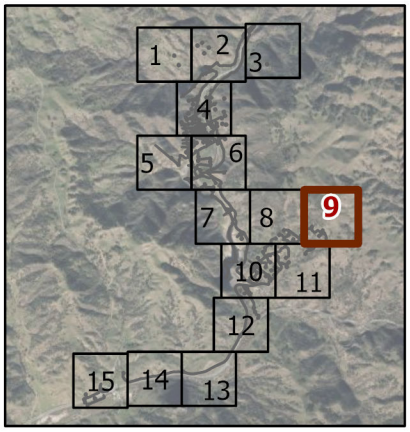

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

Study Area

Major Highway

Potential Waters of the State Outside of the Study Area

Riverine Ephemeral

Riverine Intermittent

Seasonal Wetland

N

0 150 300 Feet

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Valley Water

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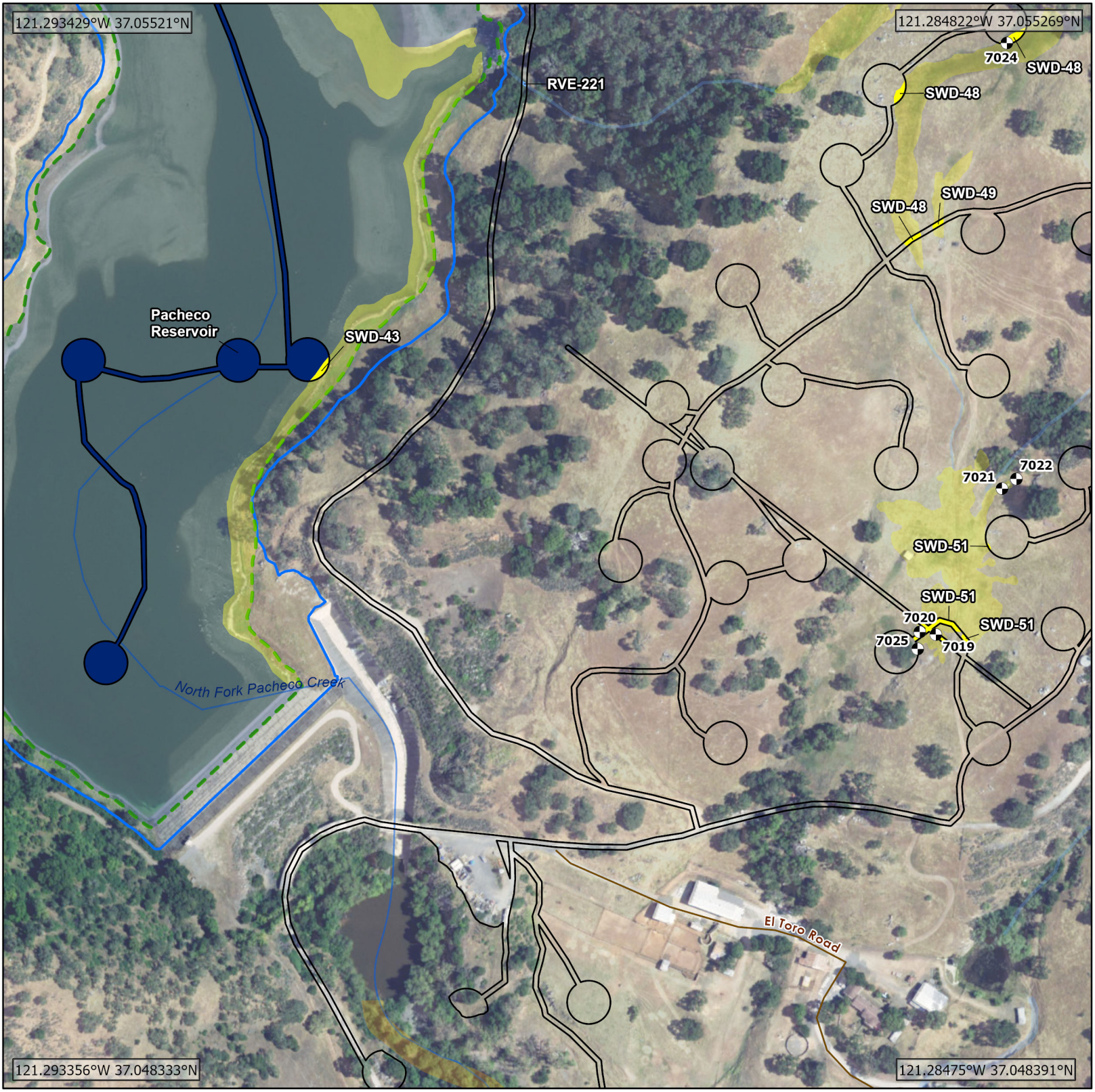

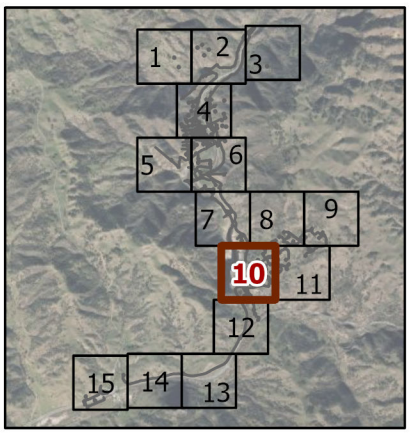

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

- Study Area
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- Pacheco Reservoir Ordinary High Water Mark (OHWM)
- Data Points
- Roads
- Major Highway
- Stream/Creek

Potential Waters of the State

- Reservoir
- Riverine Ephemeral
- Seasonal Wetland

Potential Waters of the State Outside of the Study Area

- Riverine Intermittent

N

0 150 300 Feet

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Prepared: SCP 2024-05-15

Valley Water

AECOM

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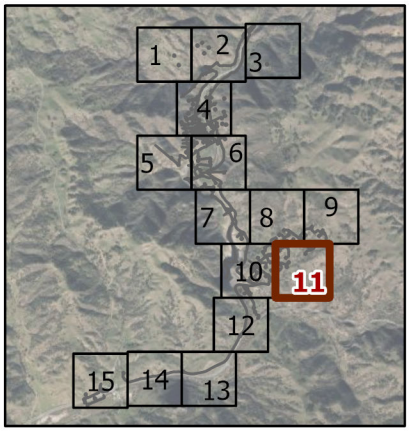

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

Study Area

Major Highway

Potential Waters of the State

Riverine Ephemeral

Potential Waters of the State Outside of the Study Area

Riverine Intermittent

N

0 150 300 Feet

Projection: CA State Plane III NAD83
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Valley Water

AECOM

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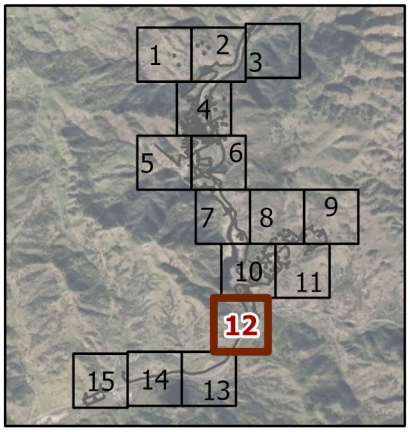

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

- Study Area
- Data Points
- Roads
- Major Highway
- Stream/Creek

Potential Waters of the State

- Riverine Ephemeral
- Riverine Intermittent

N

0 150 300 Feet

Projection: CA State Plane III NAD83
Prepared: SCP 2024-05-15

Valley Water

AECOM

Stantec GEI

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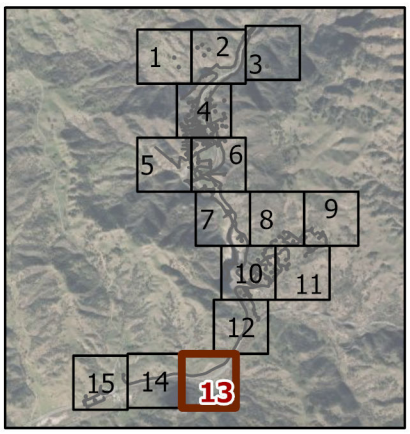

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

- Study Area
- Data Points
- Major Highway
- Stream/Creek

Potential Waters of the State

- Riverine Ephemeral

Potential Waters of the State Outside of the Study Area

- Riverine Intermittent
- Seasonal Wetland

N

0 150 300 Feet

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Prepared: SCP 2024-05-15

Valley Water

AECOM

Stantec GEI

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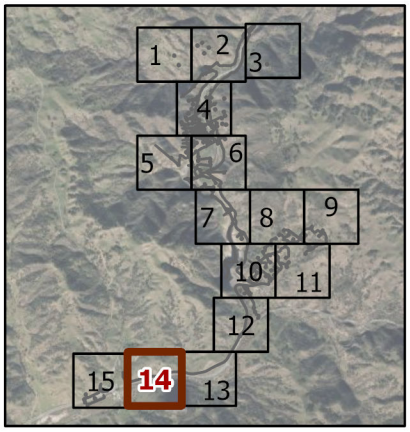

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

- Study Area
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- Major Highway
- Stream/Creek

Potential Waters of the State Outside of the Study Area

- Riverine Ephemeral
- Riverine Intermittent

N

0 150 300 Feet

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Prepared: SCP 2024-05-15

Valley Water

AECOM

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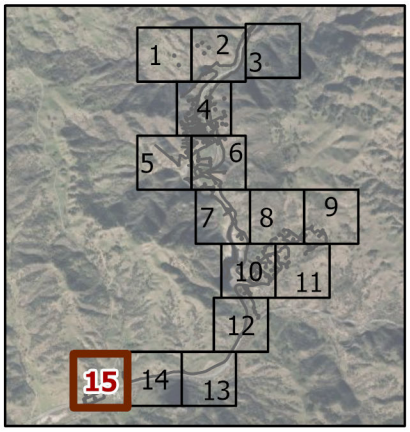

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

- Study Area
- Data Points
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- Stream/Creek

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Potential Waters of the State Outside of the Study Area

- Riverine Intermittent

N

0 150 300 Feet

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Valley Water

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Stantec GEI

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Appendix D: Biological Resources

Pacheco Reservoir Expansion Project Design Level Geotechnical Investigations

Attachment 3 - Aquatic Resources Delineation

Exhibit 3F. Photos



Source: Ascent Environmental in 2022

Representative photo of a seasonal wetland (SWD_TW_020). Photo facing north. Photo taken November 2022.



Source: Ascent Environmental in 2022

Representative photo of a seasonal wetland (SWD_TW_045). Photo facing south. Photo taken November 2022.



Source: Ascent Environmental in 2022

Representative photo of intermittent drainage RVI_KW_001. Photo facing southwest. Photo taken December 2022.

Appendix D: Biological Resources

Pacheco Reservoir Expansion Project Design Level Geotechnical Investigations

Attachment 3 - Aquatic Resources Delineation

Exhibit 3G. Aquatic Resources Excel Spreadsheet

Waters_Name	State	Cowardin_Code	HGM_Code	Meas_Type	Amount	Units	Waters_Type	Latitude	Longitude
Pacheco Reservoir	CALIFORNIA	L1	LACUSTRINF	Area	6.487	ACRE	A2.IMPDT-404	37.06133940	-121.29494702
North Fork Pacheco Creek	CALIFORNIA	R4	RIVERINE	Area	0.014	ACRE	A3.TRIB-404	37.08194406	-121.28925258
RVI-30	CALIFORNIA	R4	RIVERINE	Area	0.001	ACRE	NON-WOTUS-TRIB.NEGATIVE.A3	37.06729393	-121.29326276
RVI-31	CALIFORNIA	R4	RIVERINE	Area	0.003	ACRE	NON-WOTUS-TRIB.NEGATIVE.A3	37.06293541	-121.29353569
RVI-32	CALIFORNIA	R4	RIVERINE	Area	0.017	ACRE	NON-WOTUS-TRIB.NEGATIVE.A3	37.04581659	-121.28767066
RVI-33	CALIFORNIA	R4	RIVERINE	Area	0.001	ACRE	A3.TRIB-404	37.04618200	-121.28735400
RVI-34	CALIFORNIA	R4	RIVERINE	Area	0.003	ACRE	NON-WOTUS-TRIB.NEGATIVE.A3	37.08127886	-121.28953108
RVI-40	CALIFORNIA	R4	RIVERINE	Area	0.025	ACRE	NON-WOTUS-TRIB.NEGATIVE.A3	37.07771965	-121.29573231
RVI-42	CALIFORNIA	R4	RIVERINE	Area	0.002	ACRE	NON-WOTUS-TRIB.NEGATIVE.A3	37.06644874	-121.30007331
RVE_001a	CALIFORNIA	R6	RIVERINE	Area	0.003	ACRE	NON-WOTUS-TRIB.NEGATIVE.A3	37.03872942	-121.29870957
RVE_015b	CALIFORNIA	R6	RIVERINE	Area	0.003	ACRE	NON-WOTUS-TRIB.NEGATIVE.A3	37.03587716	-121.31461112
RVE_015c	CALIFORNIA	R6	RIVERINE	Area	0.001	ACRE	NON-WOTUS-TRIB.NEGATIVE.A3	37.03547837	-121.31439210
RVE-209	CALIFORNIA	R6	RIVERINE	Area	0.001	ACRE	NON-WOTUS-TRIB.NEGATIVE.A3	37.07387036	-121.29514044
RVE-210	CALIFORNIA	R6	RIVERINE	Area	0.001	ACRE	NON-WOTUS-TRIB.NEGATIVE.A3	37.06876687	-121.29406452
RVE-215	CALIFORNIA	R6	RIVERINE	Area	0.001	ACRE	NON-WOTUS-TRIB.NEGATIVE.A3	37.05938912	-121.29135664
RVE-217	CALIFORNIA	R6	RIVERINE	Area	0.001	ACRE	NON-WOTUS-TRIB.NEGATIVE.A3	37.05892043	-121.29120058
RVE-219	CALIFORNIA	R6	RIVERINE	Area	0.009	ACRE	NON-WOTUS-TRIB.NEGATIVE.A3	37.05652897	-121.29035347
RVE-221	CALIFORNIA	R6	RIVERINE	Area	0.001	ACRE	NON-WOTUS-TRIB.NEGATIVE.A3	37.05472816	-121.28930183
RVE-226	CALIFORNIA	R6	RIVERINE	Area	0.001	ACRE	NON-WOTUS-TRIB.NEGATIVE.A3	37.05343454	-121.28431241
RVE-227	CALIFORNIA	R6	RIVERINE	Area	0.001	ACRE	NON-WOTUS-TRIB.NEGATIVE.A3	37.04683609	-121.28815647
RVE-230	CALIFORNIA	R6	RIVERINE	Area	0.001	ACRE	NON-WOTUS-TRIB.NEGATIVE.A3	37.04740038	-121.28971612
RVE-246	CALIFORNIA	R6	RIVERINE	Area	0.001	ACRE	NON-WOTUS-TRIB.NEGATIVE.A3	37.08258625	-121.28932005
RVE-247	CALIFORNIA	R6	RIVERINE	Area	0.001	ACRE	NON-WOTUS-TRIB.NEGATIVE.A3	37.08210454	-121.28999452
RVE-248	CALIFORNIA	R6	RIVERINE	Area	0.001	ACRE	NON-WOTUS-TRIB.NEGATIVE.A3	37.08124235	-121.29040455
RVE-279	CALIFORNIA	R6	RIVERINE	Area	0.001	ACRE	NON-WOTUS-TRIB.NEGATIVE.A3	37.07828368	-121.29435981
RVE-291	CALIFORNIA	R6	RIVERINE	Area	0.001	ACRE	NON-WOTUS-TRIB.NEGATIVE.A3	37.06748573	-121.29982027
RVE-311	CALIFORNIA	R6	RIVERINE	Area	0.001	ACRE	NON-WOTUS-TRIB.NEGATIVE.A3	37.04357725	-121.29039741
SWD-21	CALIFORNIA	PUB	DEPRESS	Area	0.082	ACRE	A4-1.ADJ.WET.A1-TNW-404	37.07251303	-121.29697599
SWD-23	CALIFORNIA	PUB	DEPRESS	Area	0.202	ACRE	A4-1.ADJ.WET.A1-TNW-404	37.07031190	-121.29614952
SWD-24	CALIFORNIA	PUB	DEPRESS	Area	0.35	ACRE	A4-1.ADJ.WET.A1-TNW-404	37.06812907	-121.29529296
SWD-25	CALIFORNIA	PUB	DEPRESS	Area	0.236	ACRE	A4-1.ADJ.WET.A1-TNW-404	37.06528717	-121.29533737
SWD-26	CALIFORNIA	PUB	DEPRESS	Area	0.156	ACRE	A4-1.ADJ.WET.A1-TNW-404	37.06525089	-121.29841492
SWD-28	CALIFORNIA	PUB	DEPRESS	Area	0.158	ACRE	A4-1.ADJ.WET.A1-TNW-404	37.06324154	-121.29916671
SWD-29	CALIFORNIA	PUB	DEPRESS	Area	0.083	ACRE	A4-1.ADJ.WET.A1-TNW-404	37.06806361	-121.29406310
SWD-31	CALIFORNIA	PUB	DEPRESS	Area	0.714	ACRE	A4-1.ADJ.WET.A1-TNW-404	37.07167149	-121.29606303
SWD-32	CALIFORNIA	PUB	DEPRESS	Area	0.529	ACRE	A4-1.ADJ.WET.A1-TNW-404	37.06938359	-121.29518048
SWD-33	CALIFORNIA	PUB	DEPRESS	Area	0.001	ACRE	A4-1.ADJ.WET.A1-TNW-404	37.06501166	-121.29533013
SWD-39	CALIFORNIA	PUB	DEPRESS	Area	0.234	ACRE	A4-1.ADJ.WET.A1-TNW-404	37.06236141	-121.29481974
SWD-41	CALIFORNIA	PUB	DEPRESS	Area	0.092	ACRE	A4-1.ADJ.WET.A1-TNW-404	37.05952392	-121.29197210
SWD-43	CALIFORNIA	PUB	DEPRESS	Area	0.015	ACRE	A4-1.ADJ.WET.A1-TNW-404	37.05290076	-121.29088118
SWD-44	CALIFORNIA	PUB	DEPRESS	Area	0.003	ACRE	NON-WOTUS-WET.NEGATIVE.A4	37.05666096	-121.28211513
SWD-45	CALIFORNIA	PUB	DEPRESS	Area	0.034	ACRE	NON-WOTUS-WET.NEGATIVE.A4	37.05653194	-121.28279384
SWD-48	CALIFORNIA	PUB	DEPRESS	Area	0.043	ACRE	NON-WOTUS-WET.NEGATIVE.A4	37.05504789	-121.28543248
SWD-49	CALIFORNIA	PUB	DEPRESS	Area	0.007	ACRE	NON-WOTUS-WET.NEGATIVE.A4	37.05386253	-121.28602040
SWD-51	CALIFORNIA	PUB	DEPRESS	Area	0.054	ACRE	NON-WOTUS-WET.NEGATIVE.A4	37.05125148	-121.28599522
SWD-72	CALIFORNIA	PUB	DEPRESS	Area	0.024	ACRE	NON-WOTUS-WET.NEGATIVE.A4	37.03451629	-121.31432600
Reservoir Shoreline (Study Area Abo	CALIFORNIA	L2US	LACUSTRINF	Area	3.191	ACRE	NON-WOTUS-INTSTATE-LKPND.NEGATIVE.A5	37.06133940	-121.29494702

Appendix D: Biological Resources

Pacheco Reservoir Expansion Project Design Level Geotechnical Investigations

Attachment 4 – 2023 Eagle Survey Results Technical Memorandum

Describes the results of the 2023 eagle surveys conducted to support 2023 geotechnical investigations.

- Exhibit 4A – Figures
- Exhibit 4B – Workplan for Nesting Bald and Golden Eagle Surveys
- Exhibit 4C – 2023 Nesting Bald and Golden Eagle Survey Memorandums



Attachment 4 – 2023 Eagle Survey Results Technical Memorandum

Eagle Survey Results Supporting 2023 Geotechnical Investigations

June 2024

Prepared by:

AECOM

Stantec GEI Consultants

Prepared for:

Valley Water

Valley Water Project Number: 91954002

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Exhibit 4B – Workplan for Nesting Bald and Golden Eagle Surveys
Exhibit 4C – 2023 Nesting Bald and Golden Eagle Survey Memorandums

Acronyms and Abbreviations

CDFW	California Department of Fish and Wildlife
mph	miles per hour
Project	Pacheco Reservoir Expansion Project
Stantec	Stantec Consulting Services Inc.
study area	Eagle survey area consisting of Survey Points A-H established around geotechnical investigation areas
USFWS	United States Fish and Wildlife Service
Valley Water	Santa Clara Valley Water District
Workplan	Draft Workplan for Nesting Bald and Golden Eagle Surveys

Chapter 1. Introduction

This Technical Memorandum (TM) has been prepared in support of the Santa Clara Valley Water District's (Valley Water) Pacheco Reservoir Expansion Project (Project). This attachment summarizes the results of bald eagle (*Haliaeetus leucocephalus*) and golden eagle (*Aquila chrysaetos*) surveys conducted during the 2023 breeding season in the Project area and vicinity (see Exhibit 4A, Figures 1 and 2). The review of background literature, including a query of natural resources databases and existing literature was performed prior to initiation of surveys. The survey efforts consisted of three ground-based surveys as described in the *Draft Workplan for Nesting Bald and Golden Eagles Surveys* (Draft Workplan) (Exhibit 4B). The survey effort was conducted to support environmental compliance and permitting efforts for geotechnical investigations necessary to support design of Project facilities and for the overall Project.

Chapter 2. Location

The existing Pacheco Reservoir is located in unincorporated Santa Clara County, approximately 17 miles northeast of the City of Gilroy and about 0.4 mile north of State Route 152 as shown in Figure 1 (Exhibit 4A). Pacheco Reservoir is situated on the North Fork of Pacheco Creek. The headwaters of Pacheco Creek are in the Diablo Range, northeast of the City of Hollister. Downstream of Pacheco Reservoir, Pacheco Creek continues to flow west until it reaches San Felipe Lake, draining approximately 168 square miles in Santa Clara and San Benito counties. San Felipe Lake is drained by Miller Canal, which joins the Pajaro River and flows southwest until it drains into Monterey Bay.

Chapter 3. Methods

Prior to field surveys, published agency guidance and relevant published literature (e.g., Pagel et al. 2010, Jackman and Jenkins 2004, Wiens et al. 2015, Wiens et al. 2018) were reviewed and a desktop query of relevant databases (e.g., California Natural Diversity Database, California Academy of Sciences archives, eBird, U.S. Geologic Survey breeding bird survey data, and iNaturalist) was performed to identify previously documented eagle nesting locations within the vicinity of the Project.

Following the literature review and desktop query, ground-based eagle surveys were conducted based on United States Fish and Wildlife Service (USFWS) guidance and California Department of Fish and Wildlife (CDFW) instructions (e.g., USFWS 2012, 2013; CDFW 2017). The surveys were conducted during important detection intervals: eagle courtship and breeding, early breeding, incubation, and nest outcome (Table 1). A third ground-based survey was completed in June 2023 in response to the observation of a golden eagle carrying nesting material during the April 2023 ground-based eagle survey.

Surveys were conducted when visibility was excellent (i.e., 1-mile or greater) and during suitable weather conditions (i.e., times of rain, high winds, and fog were avoided to the extent practicable). During the surveys, the locations of all eagles observed were mapped and information on the species, age class, and behavior of the eagle or eagles (e.g., flying, perching, nesting, territorial displays, reproductive displays) was collected. Incidental observations of other raptor species were also recorded to help inform Project planning efforts, particularly geotechnical investigations.

Survey data were also collected at eight ground-based survey points (A-H) that were selected in conjunction with Valley Water within the area surrounding the proposed 2023 geotechnical investigation sites (study area). The survey point locations were chosen to provide visual coverage of the proposed geotechnical investigation sites, where accessible. A map illustrating the survey point locations is provided as Exhibit 4A, Figure 2. The Draft Workplan provided in Exhibit 4B, provides further details regarding the rationale and placement of the survey points. Surveys at each of the eight ground-based survey points (A-H) lasted approximately 4 hours to adequately document the presence or absence of eagles (Wiens et al. 2018), their behavior, and possible roost locations (USFWS 2013). Three additional survey points (I-K) were added for the June 2023 ground-based survey to visually cover a focused survey area that extended beyond the original study area due to the observation of a golden eagle exhibiting nesting behavior (carrying nesting materials) near survey point H (Figure 2).

Table 1. Ground-Based Eagle Survey Dates and Weather Conditions

Survey Type	Survey Visit	Eagle Breeding Period	2023 Survey Dates	Weather Conditions		
				Air Temperature Range (° Fahrenheit)	Sky Condition	Wind Speed
Ground	1	Early breeding/ courtship	January 24, 25, and 26	39–60	Clear or a few clouds to cloudy (high ceiling)	Calm (0-1 miles per hour [mph]) to light breeze (4-7 mph) with occasional gusts up to 15 mph
Ground	2	Incubation / nesting	April 3, 4, and 5	34–56	Clear	Calm (0-1 mph)
Ground	3	Nest Outcome	June 20, 21, and 22	51–78	Clear	Calm (0-1 mph) to light breeze (4-7 mph) with occasional gusts up to 19-24 mph

Chapter 4. Results

Numerous bald eagle and golden eagle observations were made during the surveys, with a total of 16 observations of bald eagles and 43 observations of golden eagles (Table 2). It is important to note that numbers of eagle observations are not indicative of population size as some eagles were observed from more than one survey point and more than once during a survey visit/period. No active eagle nests were observed during the surveys. However, during the second round of surveys in April 2023, a golden eagle was observed carrying nesting materials near survey point H while flying towards an area known to contain an inactive nest that was previously identified during aerial surveys in 2020. Follow-up surveys specific to this area (survey points I-K) did not detect an active nest. Further details on the methods, conditions, and results of the surveys can be found in the 2023 Nesting Bald and Golden Eagle Survey Memorandums in Exhibit 4C.

Table 2. Ground-Based Eagle Survey Eagle Observations

Survey Type	Survey Visit	Bald Eagle		Golden Eagle	
		Total Observations	Survey Points with Observations	Total Observations	Survey Points with Observations
Ground	1	3	C and G	14	B, C, E, F, G, and H
Ground	2	7	C, F, and H	27	A, B, C, D, E, F, G, and H
Ground	3	6	B, C, and D	2	G

4.1 Other Raptors

Seven other raptor species were observed during the surveys, including American kestrel (*Falco sparverius*), Cooper's hawk (*Accipiter cooperii*), peregrine falcon (*Falco peregrinus*), red-shouldered hawk (*Buteo lineatus*), red-tailed hawk (*Buteo jamaicensis*), sharp-shinned hawk (*Accipiter striatus*), and turkey vulture (*Cathartes aura*).

No active raptor nests were observed in the study area during the surveys.

Chapter 5. Discussion

Total numbers of eagle observations are not indicative of population size, but location, frequency, and behaviors observed during eagle observations can indicate what habitats eagles are utilizing and in what capacity. Because fewer bald and golden eagles were observed during the last field survey in comparison to the earlier survey efforts, this suggests eagles were likely actively on nests (outside the study area) during the later survey.

Bald eagle use of the survey area appears to be closely tied to Pacheco Reservoir and Pacheco Creek, though upland habitats in the vicinity were also utilized. Golden eagle use of the survey area is more broad ranging and often concentrated in areas of steeper terrain. No active bald or golden eagle nests were identified during the 2023 eagle breeding season ground-based surveys. Aerial surveys were not performed during the 2023 breeding season. In future years, aerial surveys are recommended to accurately determine the location of active bald and golden eagle nests and associated breeding ranges.

Chapter 6. References

California Department of Fish and Wildlife. 2017. Bald Eagle Breeding Survey Instructions. Available: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=83706. Accessed: 2 December 2019.

Jackman, R.E., and J.M. Jenkins. 2004. Protocol for Evaluating Bald Eagle Habitat and Populations in California. Prepared for the U.S. Fish and Wildlife Service, Endangered Species Division, Forest and Foothills Ecosystem Branch, 2800 Cottage Way, Room-W-2605, Sacramento, CA 95825.

Pagel, J.E., D.M. Whittington, and G.T. Allen. 2010. Interim Golden Eagle Technical Guidance: Inventory and Monitoring Protocols; and Other Recommendations in Support of Golden Eagle Management and Permit Issuance. Available: https://www.fws.gov/southwest/es/oklahoma/documents/te_species/wind%20power/usfws_interim_goea_monitoring_protocol_10march2010.pdf. Accessed 2 December 2019.

U.S. Fish and Wildlife Service. 2012. U.S. Fish and Wildlife Service Land-Based Wind Energy Guidelines. OMB Control Number 1018-0148, March 23, 2012. 71 pp.

U.S. Fish and Wildlife Service. 2013. Eagle Conservation Plan Guidance: Module 1 - Land-Based Wind Energy, Version 2. U.S. Department of the Interior, Fish and Wildlife Service, Division of Migratory Bird Management. April 2013.

Wiens, J.D., P.S. Kolar, M.R. Fuller, W.G. Hunt, and T. Hunt. 2015. Estimation of Occupancy, Breeding Success, and Abundance of Golden Eagles (*Aquila chrysaetos*) in the Diablo Range, California, 2014: U.S. Geological Survey Open-File Report 2015-1039, 23 p.

Wiens, J.D., P.S. Kolar, M.R. Fuller, W.G. Hunt, T. Hunt, and D.A. Bell. 2018. Spatial Patterns in Occupancy and Reproduction of Golden Eagles During Drought: Prospects for Conservation in Changing Environments: The Condor Ornithological Applications Volume 120, 2018, 106-124 p.

Appendix D: Biological Resources

Pacheco Reservoir Expansion Project Design Level Geotechnical Investigations

Attachment 4 – Exhibits 4A through 4C.

- Exhibit 4A – Figures
- Exhibit 4B – Workplan for Nesting Bald and Golden Eagle Surveys
- Exhibit 4C – 2023 Nesting Bald and Golden Eagle Survey Memorandums

Appendix D: Biological Resources

Pacheco Reservoir Expansion Project Design Level Geotechnical Investigations

Attachment 4 – 2023 Eagle Survey Results Technical Memorandum

Exhibit 4A – Figures

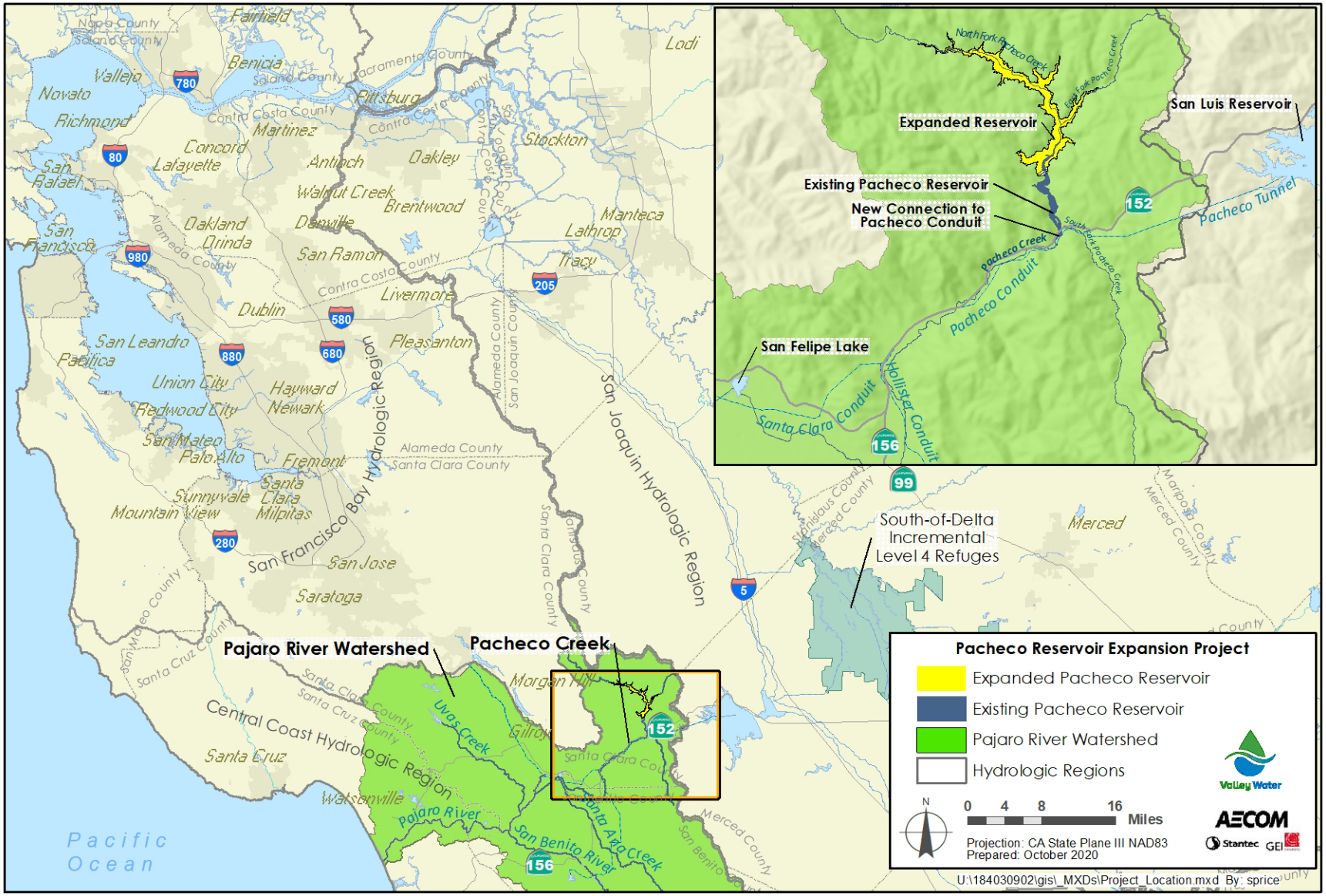

Exhibit 4A, Figure 1. Regional Location

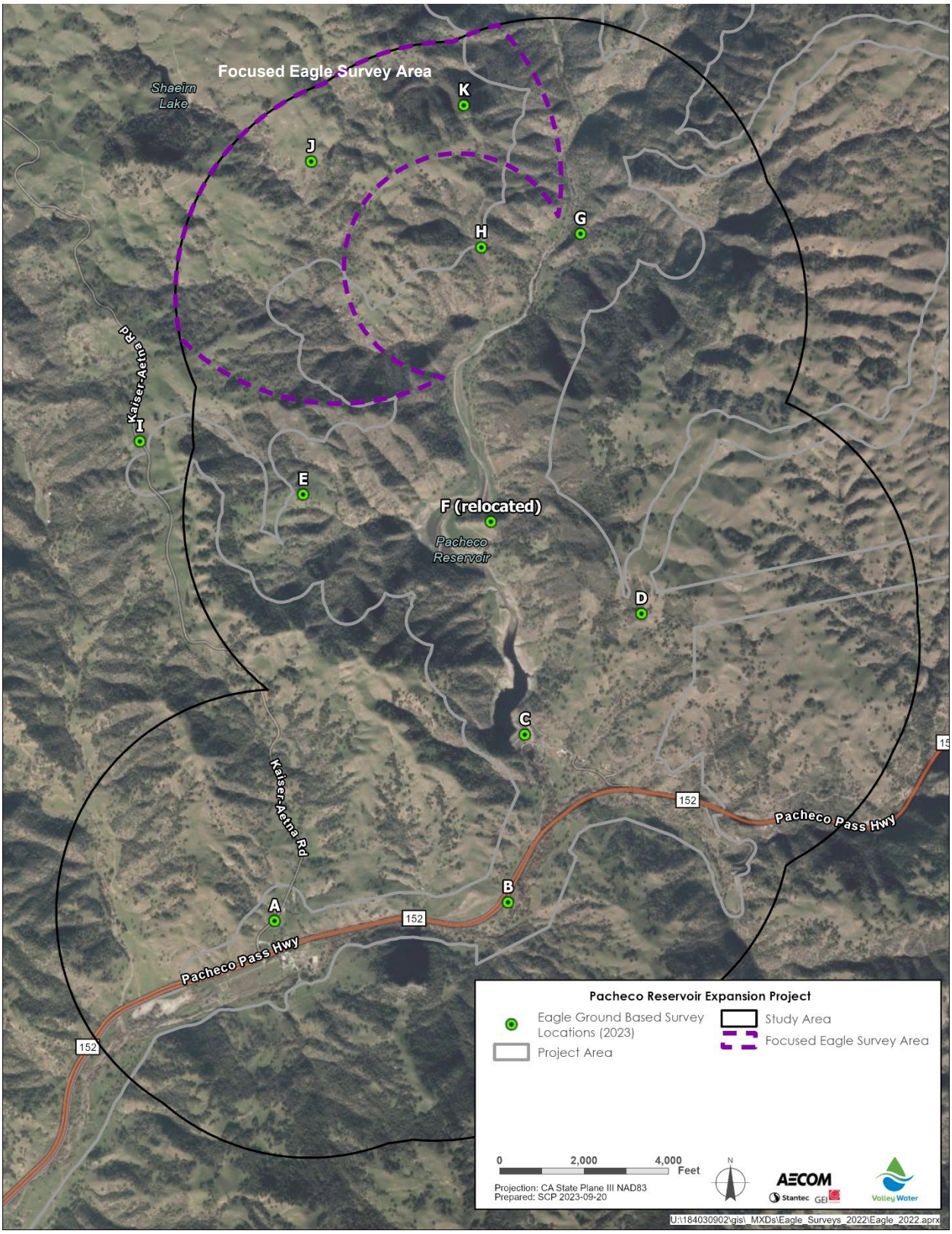

Exhibit 4A, Figure 2. Eagle Observations Points

Appendix D: Biological Resources

Pacheco Reservoir Expansion Project Design Level Geotechnical Investigations

Attachment 4 – 2023 Eagle Survey Results Technical Memorandum

Exhibit 4B – Workplan for Nesting Bald and Golden Eagle Surveys

Draft



Workplan for Nesting Bald and Golden Eagle Surveys

Pacheco Reservoir Expansion Project

December 2019

Prepared by:

AECOM

Stantec GEI

Prepared for:

Valley Water

Valley Water Project Number: 91954002

Quality Information

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Revision History

Revision	Revision date	Details	Authorized	Name	Position
0	12/6/2019	Draft	Yes	Nick Eide	Biologist

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Acronyms and Abbreviations

BGEPA	Bald and Golden Eagle Protection Act
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CVP	Central Valley Project
EO	Executive Order
MBTA	Migratory Bird Treaty Act
PPWD	Pacheco Pass Water District
Project	Pacheco Reservoir Expansion Project
SBCWD	San Benito County Water District
TM	Technical Memorandum
Valley Water	Santa Clara Valley Water District
USFWS	U.S. Fish and Wildlife Service

Executive Summary

A combination of ground-based and aerial surveys is proposed to identify locations of bald and golden eagle nests, and to evaluate reproductive performance for the nesting population in the vicinity of the Pacheco Reservoir Expansion Project (Project) proposed by Santa Clara Valley Water District. This information will aid in developing appropriate avoidance, minimization, and mitigation measures and will enhance future project planning, including construction and implementation of the Project as well as focused geotechnical investigations in support of Project design. The proposed ground-based and aerial surveys are summarized in Table ES-1.

Table ES-1. Summary of Ground and Aerial Surveys for Bald and Golden Eagles

Survey Type	Rational	Schedule
Ground Based Surveys	Early breeding/courtship	December 2019/January 2020
	Incubation/nesting	February-April 2020
Aerial Surveys	Early incubation/nesting	March 2020
	Nesting	April/May 2020
	Nest outcomes	June 2020

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Chapter 1. Introduction

This Technical Memorandum (TM) has been prepared in support of the Santa Clara Valley Water District's (Valley Water) Pacheco Reservoir Expansion Project (Project). This TM has been prepared as a general workplan to describe surveys to detect nesting bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*) in the area of the Project to support environmental compliance and permitting for the construction and implementation of the Project. In addition, results of the surveys are anticipated to support environmental compliance and permitting efforts for Phase 2 geotechnical investigations necessary to support design of Project facilities.

The Project is a multi-agency effort to provide water supply reliability, environmental restoration, and other benefits through the construction of new facilities and long-term operation strategies. The Project would include expanding the storage capacity of the existing Pacheco Reservoir to up to approximately 140,000 acre-feet (AF) through construction of a new dam, conveyance facilities, and appurtenant infrastructure.

1.1 Background

The existing Pacheco Reservoir and North Fork Dam were constructed in 1939 by the Pacheco Pass Water District (PPWD) to provide irrigation and domestic water supply. These facilities are owned and operated by the PPWD. The existing reservoir has an operational capacity of 5,500 AF. Water released from the reservoir flows down Pacheco Creek and recharges the underlying groundwater aquifer. Agricultural water users in PPWD and San Benito County Water District (SBCWD) pump water from the aquifer.

The Project includes construction and operation of a new dam and reservoir, pump station, conveyance facilities, and related miscellaneous infrastructure (e.g., access roads). The new dam and reservoir would be constructed on Pacheco Creek upstream from the existing North Fork Dam and would inundate most of the existing Pacheco Reservoir. Water will be collected in the new reservoir during the winter months from runoff from the local watershed area, and diversion of Central Valley Project (CVP) supplies from San Luis Reservoir via Pacheco Conduit, as available.

1.2 Project Location

The existing Pacheco Reservoir is located in unincorporated Santa Clara County, approximately 17 miles northeast of the City of Gilroy and 1 mile north of State Route 152 as shown in Figure 1-1. Pacheco Reservoir is situated on the North Fork of Pacheco Creek. The headwaters of Pacheco Creek are in the Diablo Range, northeast of the city of Hollister. Downstream of Pacheco Reservoir, Pacheco Creek continues to flow west until it reaches San Felipe Lake, draining approximately 168 square miles in Santa Clara and San Benito counties. San Felipe Lake is drained by Miller Canal, which joins the Pajaro River and flows southwest until it drains into Monterey Bay.

San Luis Reservoir is located eight miles east of Pacheco Reservoir in unincorporated Merced County. Reclamation owns and jointly operates San Luis Reservoir with the California Department of Water Resources to provide seasonal storage for the CVP and the State Water

Project. Deliveries from San Luis Reservoir to CVP San Felipe Division of the CVP (i.e., deliveries to Valley Water and SBCWD) flow west through Pacheco Pumping Plant and Conduit.

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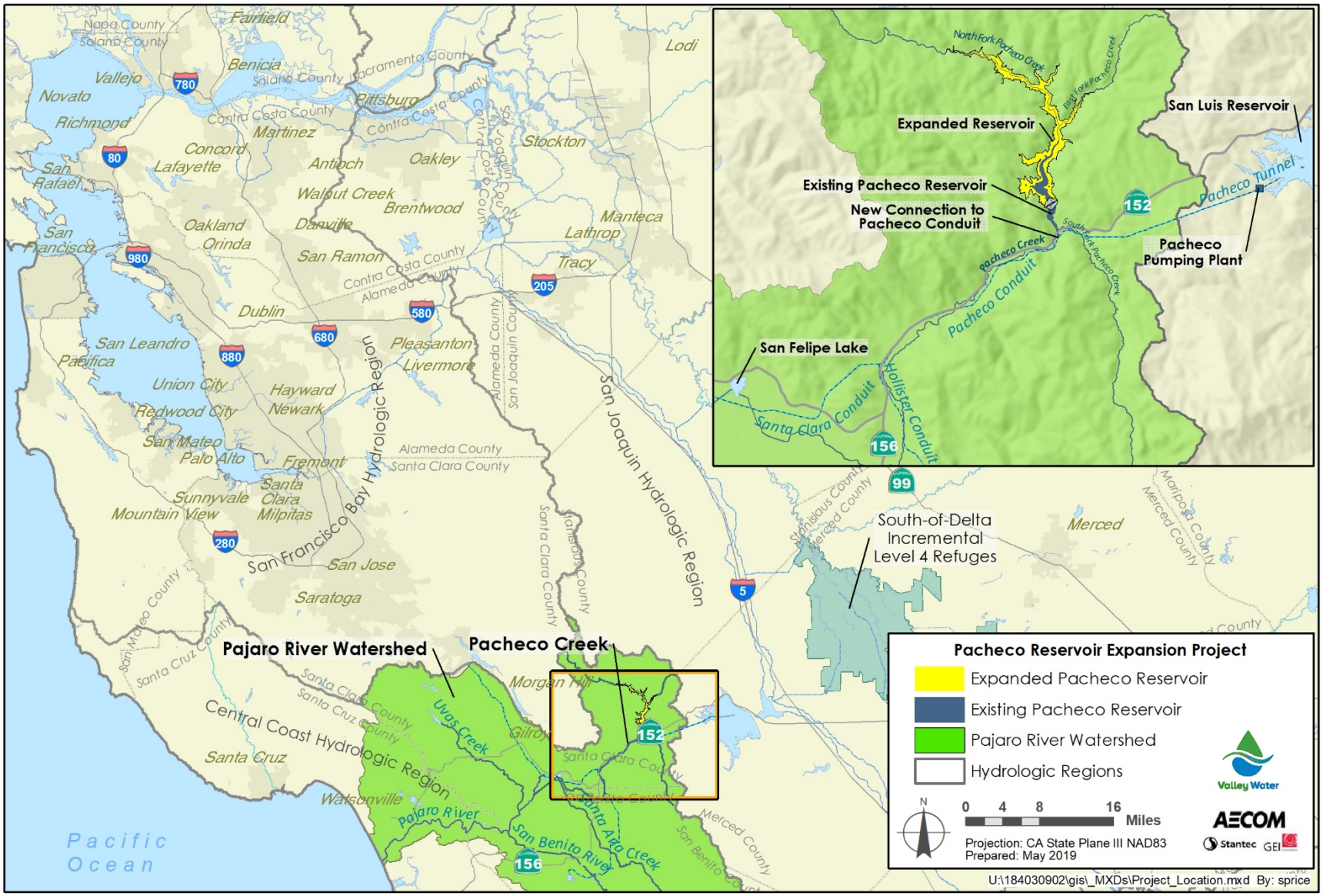

Figure 1-1. Pacheco Reservoir Expansion Project Location

Chapter 2. Regulatory Overview

2.1 Bald and Golden Eagle Protection Act

The U.S. Fish and Wildlife Service (USFWS) enforces protections for bald and golden eagles and regulates the issuance of take permits within the Bald and Golden Eagle Protection Act (BGEPA; 50 Code of Federal Regulations [CFR] part 22).

2.1.1 50 CFR 22.26

This regulation created a permit provision for eagle "take" (defined to include ". . . pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, destroy, molest, or disturb") that is associated with, but not the purpose of an activity.

2.1.2 50 CFR 22.27

This regulation created a permit provision for removal, relocation, or destruction of eagle nests under specific circumstances, when: 1) necessary to alleviate a safety emergency to people or eagles; 2) necessary to ensure public health and safety; 3) the nest prevents the use of a human-engineered structure, or; 4) the activity, or the mitigation for that activity, will provide a net benefit to eagles.

2.2 Migratory Bird Treaty Act

This legislation, administered by the USFWS and U.S. Department of Justice, implements treaties to protect nearly 2,000 species of migratory birds in the U.S., Canada, Mexico, Japan, and Russia. Under the Migratory Bird Treaty Act (MBTA) it is illegal to take migratory birds (which includes both bald and golden eagles), their eggs, nests, or young. There is no take permit pursuant to the MBTA. However, in December 2017, the U.S. Department of the Interior issued a Memorandum that concluded that the MBTA does not prohibit the incidental taking of migratory birds. This effectively ended the longstanding prohibition of even unintended take pursuant to otherwise lawful and permitted activities. The MBTA's prohibitions on pursuing, hunting, taking, capturing, killing or attempting to do so are effectively interpreted as applying only to affirmative actions that have as their intended purpose the taking or killing of migratory birds, their nests, or their eggs. The opinion is significant because it reverses the Department of Interior's prior interpretation of the MBTA as a strict liability statute regardless of intent.

2.3 Executive Order 13186

Directs federal departments and agencies to take certain actions to further implement the MBTA. This Executive Order (EO) directs federal agencies, whose actions will likely result in the take of migratory birds, to develop and implement a Memorandum of Understanding with the USFWS to promote the conservation of bird populations. This EO applies to all federal agency actions. Certain federal actions are exempted from this EO but those actions may still be prohibited by the MBTA itself.

2.4 California Endangered Species Act

The bald eagle is listed as Endangered pursuant to the California Endangered Species Act.

2.5 California Fully Protected Species

Both the bald eagle and the golden eagle are listed as “Fully Protected” species by the California Department of Fish and Wildlife (CDFW). There is no take permit provision for fully protected species. Accordingly, take cannot be permitted by the CDFW.

2.6 California Environmental Quality Act

Valley Water, the Project proponent is a discretionary agency under California Environmental Quality Act (CEQA) and is required to comply with CEQA for all investigations and actions associated with the Project.

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Chapter 3. Methods

Evaluating project impacts on nesting eagles requires an understanding of the population, nest locations, and nesting biology. These data can aid with development of project-specific avoidance and minimization measures, and reduce potential impacts by the following: scheduling certain work activities to avoid the nesting season (thereby avoiding impacts, and the need to mitigate for those impacts); micro-siting Project features to reduce potential Project impacts on nesting eagles and raptors; and, developing appropriate avoidance buffer zones around nesting locations (California Energy Commission and California Department of Fish and Game 2007, USFWS 2013).

Nest surveys for eagles and other raptors are used to understand the species composition of the nesting cohort of raptors and their nest locations in the project footprint and affected surroundings. The results of these surveys can be used to estimate impacts, and propose mitigation measures. A secondary objective is to understand the nesting productivity (i.e., the number of nestlings that successfully fledged). This is because failure to nest (e.g., because a raptor failed to secure a mate, or a mated pair failed to secure a nesting territory), and failure to nest successfully (i.e., a nest was initiated, but failed to produce surviving fledglings), are the two variables that most limit raptor populations (Newton 1979). The survey approach proposed below is designed to detect early eagle courtship behavior and territoriality for failure to nest and failure to nest successfully estimates, which are factored into estimates of nesting productivity (i.e., estimated number of chicks to survive to the age of fledging). This will minimize the overestimation bias that can result when evaluating population-level productivity based solely on successful nests.

3.1 Overview and Survey Areas

Prior to field surveys, a database review will be performed to identify known/documented eagle nesting locations (i.e., both active or historic and inactive nest locations) within a 1-mile buffer of the maximum Project footprint. Figure 3-1 displays the maximum Project footprint. A combination of ground and aerial nest surveys will be scheduled and sequenced based on USFWS guidance and CDFW instructions (e.g., USFWS 2012, 2013; CDFW 2017) to detect important intervals: early breeding, incubation, early nesting, and late nesting. This survey approach is designed to maximize detection probability, to locate nests sites accurately, and determine nest success at various milestones. Field survey methods will follow USFWS (2013) and CDFW Bald Eagle Breeding Survey Instructions (CDFW 2017), other published agency guidance, and relevant published literature (e.g., Pagel et al. 2010, Jackman and Jenkins 2004, Wiens et al. 2015).

The survey area for both the ground and aerial-based surveys will include the maximum Project footprint, which encompasses all currently planned construction activities, potential impact areas associated with the Project (e.g., reservoir inundation area), and potential indirect impacts along Pacheco Creek between the new dam and San Felipe Lake), plus a 1-mile (1.6 kilometers) buffer to identify eagles that may be nesting in the vicinity. The survey area for the eagle surveys will total approximately 50,000 acres (i.e., about 78 square miles). The survey area will be uploaded to GPS-enabled tablets that will be used during ground and aerial surveys to identify the survey boundary, track survey progress, and map nest or eagle observations.

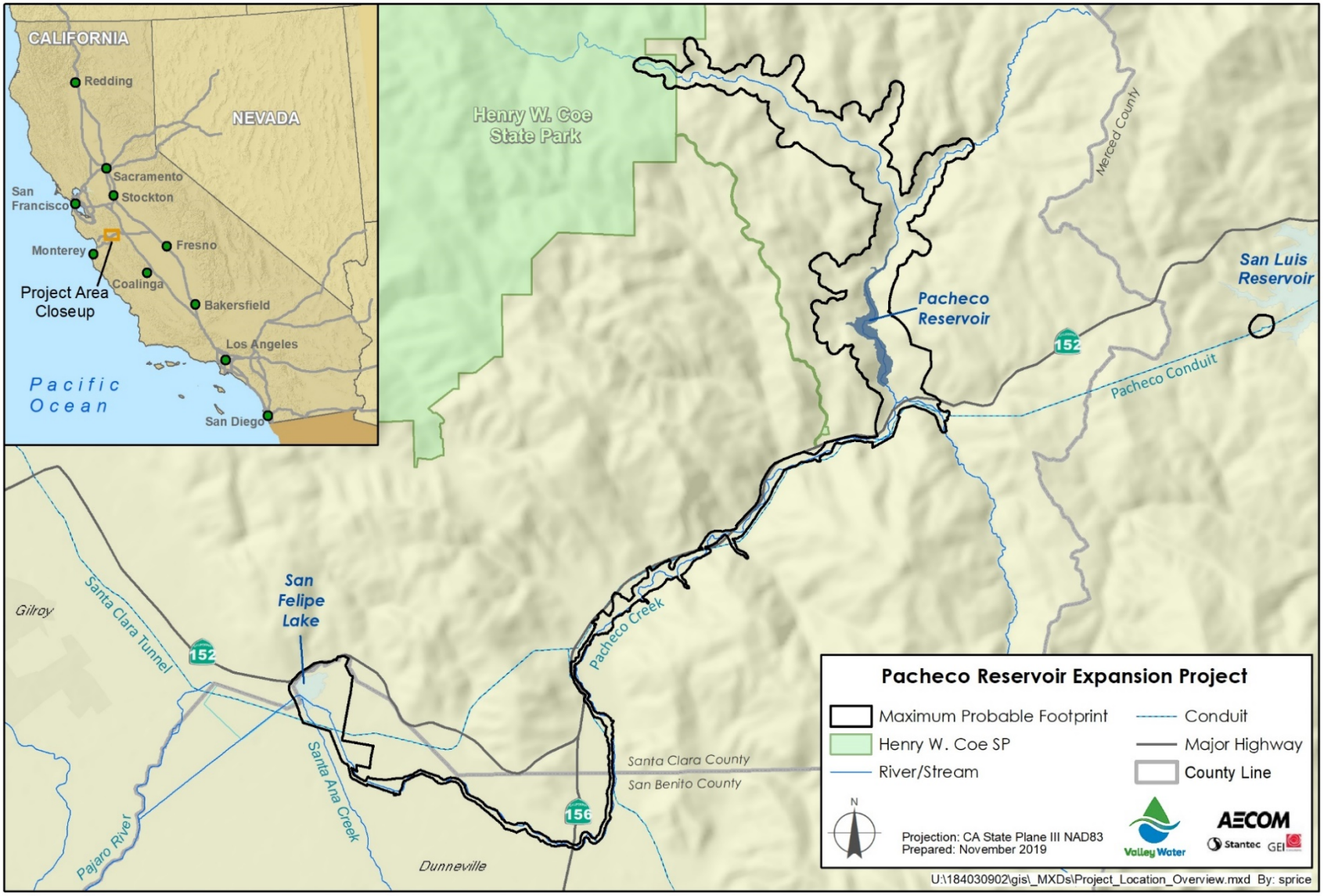

Figure 3-1 Maximum Project Footprint

During ground and aerial surveys, the location of any eagle identified flying, perching, nesting, or conducting territorial and/or reproductive displays will be mapped using GPS and information on the species, age class, and behavior of eagles will be collected using standardized survey data forms (Attachment A). Incidental observations of other raptor species will also be recorded to help inform Project planning efforts and potential future geotechnical activities.

3.2 Desktop Preparation

In preparation for ground-based and aerial surveys, database searches will be conducted and current literature on bald and golden eagle nesting locations within the survey area will be . Database review may include, but are not limited to, CDFW's California Natural Diversity Database, California Academy of Sciences archives, eBird, U.S. Geologic Survey breeding bird survey data, and iNaturalist. Results of the database search will be used to inform/focus the ground and aerial survey efforts.

3.3 Ground-Based Surveys

Ground-based surveys will be conducted using a survey-point method. The survey-point method is similar to the point-count technique and consists of observers conducting surveys at pre-established survey points to look for the presence/absence of bald and golden eagles and note behavioral observations and nest locations. Locations for ground-based surveys will be chosen to maximize survey coverage, sample a number of different vantage points, potential nesting habitats (e.g., cliffs, transmission line towers, tall trees), and land uses types both within the survey area that is legally accessible to Valley Water and its consultant team (e.g., publicly accessible areas). It is expected that about 10 to 15 locations will be selected for ground-based surveys. Surveys at each of the locations selected will be "long-duration" (i.e., about 4 to 6 hours) surveys to adequately document the presence of eagles, their behavior, and possible roost locations (USFWS 2013).

If feasible (e.g., weather conditions and access permitting) ground-based surveys may also include focused area surveys (CEC and CDFG 2007) around the existing Pacheco Reservoir via a small boat and/or meandering transect surveys in suitable downstream riparian areas. Observations during the surveys could include foraging, roosting, courtship flights and pair-bonding, nest-building, or displays of territorial defense. These behaviors are not readily detected during aerial surveys but can be used to indicate the possibility of nests that could be detected during aerial surveys. Where access is permitted the ground-based surveys will also be used to locate and further inspect suitable nesting substrates (e.g., trees, cliffs, and natural features, as well as transmission line towers or other anthropogenic structures, and any known historic nesting locations for both bald and golden eagles).

Ground-based surveys are proposed to begin early in the eagle breeding season in December 2019 or January 2020 and will extend through April 2020 (pending access and weather conditions). Up to three visits will be made to each survey location during this time period and are expected to yield multiple observations on different dates, improving detection probability (Wiens et al. 2015). Table 3-1 below provides a summary of the survey types and proposed schedule.

Table 3-1. Summary of Ground and Aerial Surveys for Bald and Golden Eagles

Survey Type	Rational	Schedule
Ground Based Surveys	Early breeding/courtship	December 2019/January 2020
	Incubation/nesting	February-April 2020
Aerial Surveys	Early incubation/nesting	March 2020
	Nesting	April/May 2020
	Nest outcomes	June 2020

3.4 Aerial Surveys

Up to three aerial nest surveys will be conducted via helicopter. Three biologists experienced in aerial nest searches will conduct surveys (excluding the pilot), and following applicable safe work practices, and upon receiving any required additional training to comply with Project and contract-specific safety requirements. As shown in Table 3-1, the first survey will ideally be timed during the early incubation/nesting period for eagles (e.g., early- to mid-March) (CDFW 2017) and the second survey occurring later on during the nesting period (e.g., late April-early May) (CDFW 2017). If needed, a third aerial survey will be conducted to record nest outcomes in late nesting period (e.g., early to mid-June) (CDFW 2017). Both USFWS and CDFW guidelines/protocols will be followed (e.g., to avoid take of eagles during the aerial surveys).

Aerial nest surveys for early incubation and early nesting will be separated by at least 30 days, ideally during the normal courtship and mid-incubation periods, respectively. These two surveys will be used to identify locations of active eagle nests, and confirm the location of any potential eagle nests identified as part of the database search and or ground-based survey efforts. Locations of active nests will be mapped using GPS. If active eagle nests are identified during the first two helicopter aerial surveys, a third aerial eagle nesting survey will be implemented during the fledging period, and before the completion of the nesting season in 2020, to determine if an active nest is successful at fledging young.

3.5 Deliverables

The results of the desktop research, ground-based surveys, and aerial surveys for bald and golden eagles will be provided in an eagle survey technical memorandum. The technical memorandum would include an introduction, descriptive Project information, regulatory framework, survey methods, survey results, recommendations, and conclusion. The survey results would include the information collected during the surveys including eagle nesting locations, and the applicable demographic, behavior, and habitat information obtained during the surveys. The technical memorandum would serve as a stand-alone summary report of the surveys performed, which would be used in support of the environmental compliance and permitting efforts for the Project.

Chapter 4. References

California Energy Commission and California Department of Fish and Game (CEC and CDFG). 2007. California Guidelines for Reducing Impacts to Birds and Bats from Wind Energy Development. Commission Final Report. California Energy Commission, Renewables Committee, and Energy Facilities Siting Division, and California Department of Fish and Game, Resources Management and Policy Division. CEC-700-2007-008-CMF.

California Department of Fish and Wildlife (CDFW) 2017. Bald eagle breeding survey instructions. Accessed: 2 December 2019.

Jackman, R.E., and J.M. Jenkins. 2004. Protocol for Evaluating Bald Eagle Habitat and Populations in California. Prepared for the U.S. Fish and Wildlife Service, Endangered Species Division, Forest and Foothills Ecosystem Branch, 2800 Cottage Way, Room-W-2605, Sacramento, CA 95825.

Newton, I. 1979. Population ecology of raptors. Buteo Books, Vermillion, SD. 399pp.

Pagel, J.E., D.M. Whittington, and G.T. Allen. 2010. Interim golden eagle technical guidance: inventory and monitoring protocols; and other recommendations in support of golden eagle management and permit issuance. Available: https://www.fws.gov/southwest/es/oklahoma/documents/te_species/wind%20power/usfws_interim_goea_monitoring_protocol_10march2010.pdf. Accessed 2 December 2019.

U.S. Fish and Wildlife Service (USFWS). 2012. U.S. Fish and Wildlife Service Land-Based Wind Energy Guidelines. OMB Control Number 1018-0148, March 23, 2012. 71 pp.

_____. 2013. Eagle Conservation Plan Guidance: Module 1 - Land-Based Wind Energy, Version 2. U.S. Department of the Interior, Fish and Wildlife Service, Division of Migratory Bird Management. April 2013.

Wiens, J.D., P.S. Kolar, M.R. Fuller, W.G. Hunt, and T. Hunt. 2015. Estimation of occupancy, breeding success, and abundance of golden eagles (*Aquila chrysaetos*) in the Diablo Range, California, 2014: U.S. Geological Survey Open-File Report 2015-1039, 23 p.

DRAFT

Workplan for Nesting Bald and Golden Eagle Surveys

Bald and Golden Eagle Survey Data Forms

Bald Eagle and Golden Eagle Aerial Survey

Date	
Observer(s)	
Aerial Service	
Helicopter Type	
General Survey Area	
Survey Start Time	
Survey End Time	
Visibility	
Wind	
Cruise Speed	
Survey Speed	
Survey Tracks Recorded	
Survey Observations[1]	
General Comments	

DRAFT

Bald Eagle and Golden Eagle Ground Survey

DATE:

OBSERVER(S): **WEATHER CONDITIONS:** **Sky[1]:** 0 **Wind[2]:** 1-2 **Air (°F):** 50

Survey Point Number	Start Time	End Time	Eagle Species Observed[3]	Notes[4]

General comments:[5]

Notes:
[1] Weather Bureau codes.
[2] Beaufort codes.
[3] BAEA=bald eagle; GOEA=golden eagle.
[4] Note age class, all behavioral activities, distance, bearing, heading, and other observations; also record observations on aerial photo or quad map.
[5] Note any relevant general observations for areas surveyed including general habitat and land use, human interactions, and potential forage species observed.

DRAFT

California Department of Fish and Game
CALIFORNIA BALD EAGLE

NESTING TERRITORY SURVEY FORM

Revised 9/2017

Territory Code:

County:_____ **Survey Year:** _____

Property Owner:_____ **If USFS:**_____National Forest

Name (or general location of territory): _____

Name of nearest water body: _____

Location of Nest Site: LAT:_____**LONG:** _____

Other location info: _____

No. of nests in territory - Intact:_____**Remnant:** _____

Nest Tree: Species:_____**Year last Used:** _____

Nest: Year last used _____

NOTE: Please attach a map showing the location of any newly documented nest tree.

Describe tree and nest condition and size, and add other remarks: _____

For each visit to a territory, note, in detail, the times, number and age of birds, behavior of birds (lying, perching, etc.), evidence of nesting (nest maintenance, courtship, incubation posture), disturbances, and other pertinent information:

Initials of Observer	Date of Visit	Observations

(Attach additional pages, if necessary)

Initials of Observer	Date of Visit	Observations

(Attach additional pages, if necessary)

General Remarks: _____

_____

_____

PLEASE SUMMARIZE:

A. Successful Nestings: No. of young known fledged_____or probably fledged _____

B. If no fledglings were produced this season please answer the following:

How many adults were seen in the territory? _____

Was there evidence of nest repair or construction? Yes ☐ No ☐

Were adults seen in the nest? Yes ☐ No ☐

Were adults in incubating posture? Yes ☐ No ☐

Number of nestlings observed? _____

Failed during incubation: _____ or nestling stage:_____ .

Other remarks: _____

_____

Observer(s) name: _____

Affiliation:_____

Address: _____

Phone: ( ) _____ **Fax:** ( ) _____ **Email:** _____

Mail all completed forms by September 1 of survey year to: ATTN: Carie Battistone, California Department of Fish and Wildlife, Wildlife Branch, 1812 Ninth Street, Sacramento, CA 95814. Or email completed forms to Carie.Battistone@wildlife.ca.gov.

ADDITIONAL OBSERVATIONS:

Territory:_____ Year: _____

Initials of Observer	Date of Visit	Observations (continued)

Appendix D: Biological Resources

Pacheco Reservoir Expansion Project Design Level Geotechnical Investigations

Attachment 4 – 2023 Eagle Survey Results Technical Memorandum

Exhibit 4C – 2023 Nesting Bald and Golden Eagle Survey Memorandums

Final Draft



Eagle Survey Technical Memorandum

January 2023 Ground-Based Eagle Surveys

July 2023

Prepared by:

AECOM

Stantec GEI Consultants

Prepared for:

Valley Water

Valley Water Project Number: 91954002

Quality Information

Prepared By	Checked By	Verified By	Approved By
Chariss Femino	Mark Noyes	Paul Uncapher	Mary Paasch

Revision History

Revision	Revision date	Details	Authorized	Name	Position
0	2/15/2023	Preliminary Draft	Yes	Mark Noyes	Senior Ecologist
1	3/15/2023	Draft	Yes	Mark Noyes	Senior Ecologist
2	5/26/2023	Final Draft	Yes	Mark Noyes	Senior Ecologist
3	7/05/2023	Final Draft	Yes	Mark Noyes	Senior Ecologist

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Acronyms and Abbreviations

Project	Pacheco Reservoir Expansion Project
Stantec	Stantec Consulting Services, Inc.
Valley Water	Santa Clara Valley Water District
Workplan	Draft Workplan for Nesting Bald and Golden Eagle Surveys

Chapter 1. Introduction

On behalf of the Santa Clara Valley Water District (Valley Water) and AECOM, Stantec Consulting Services Inc. (Stantec) biologists conducted the first-round of 2023 ground-based eagle surveys for Valley Water's Pacheco Reservoir Expansion Project (Project) to support AECOM's proposed 2023 geotechnical investigations. The survey was conducted during the week of January 23, 2023, to coincide with the eagle early breeding and courtship period, and followed the methods provided in the January 2020 *Draft Workplan for Nesting Bald and Golden Eagle Surveys* (Workplan) for the Project. This memorandum summarizes the results of the initial January 2023 ground-based surveys.

Chapter 2. Methods

The first-round of 2023 ground-based eagle surveys was conducted by Stantec biologists on January 24, 25, and 26, 2023. The surveys coincided with the early breeding and courtship period for both eagle species, bald eagle (*Haliaeetus leucocephalus*) and golden eagle (*Aquila chrysaetos*). These surveys were conducted at eight ground-based survey points that were selected in conjunction with Valley Water within the area surrounding the proposed 2023 geotechnical investigation sites (study area). The survey point locations were chosen to provide visual coverage of the proposed geotechnical investigation sites, where accessible. A map illustrating the survey point locations is provided as Attachment A, Figure 1. The survey team included three experienced biologists with sufficient eagle survey experience or sufficient training with an experienced surveyor to recognize each species, including juveniles, and the survey was conducted as described in the Workplan. Binoculars and spotting scopes were used to identify eagles (e.g., Nikon binoculars with 10x42 magnification). Data was collected on cell phones and/or iPads using ESRI ArcGIS Field Maps software. Approximately 4 hours of survey time was spent at each survey point. All surveys were conducted during suitable weather conditions (i.e., times of rain, high winds, and fog were avoided). Visibility was good (i.e., 1 mile or greater visibility); and sky conditions varied from clear to a few scattered clouds to high-ceiling clouds. Air temperatures ranged from 39 to 60 degrees Fahrenheit, and wind conditions varied from calm (0-1 mile per hour) to moderately breezy (4-7 miles per hour) with occasional gusts up to 15 miles per hour.

Chapter 3. Results

A total of 3 bald eagle and 14 golden eagle observations were made within the study area over the 3-day period during the first round of ground-based eagle surveys. Two (2) of the 14 golden eagle observations were of courtship behavior. Additionally, one eagle was observed within the study area that was not identified to species due to observational circumstances (e.g., distance from observer, difficult lighting). No potential inactive or active eagle nests were detected. Nests identified during past survey efforts in prior years are depicted in Attachment A, Figure 1. Aerial surveys planned for 2023 were cancelled, due to cancellation of geotechnical work planned for 2023.The results of this survey are further summarized below by species, and a map depicting the approximate locations of observed eagles and potential nest locations is provided as Attachment A, Figure 2.

3.1 Bald Eagles

Three observations of adult bald eagles were made during the 3 days of surveying. Bald eagle observations were made from survey points C and G. One observation was of two adult bald eagles exhibiting territorial displays near survey point C. The other was of one bald eagle soaring over the ridge to the west of survey point G (Figure 1).

3.2 Golden Eagles

Fourteen (14) separate observations of golden eagles (adults and juveniles) were made during the 3 days of surveying. Golden eagles were observed from survey points B, C, E, F, G, and H. Golden eagle behaviors observed were primarily soaring, including two observations of pairs soaring together. Two observations of golden eagle courtship were made from survey points G and H. In addition, one golden eagle was observed perched in a tree north of survey point E (Figure 1).

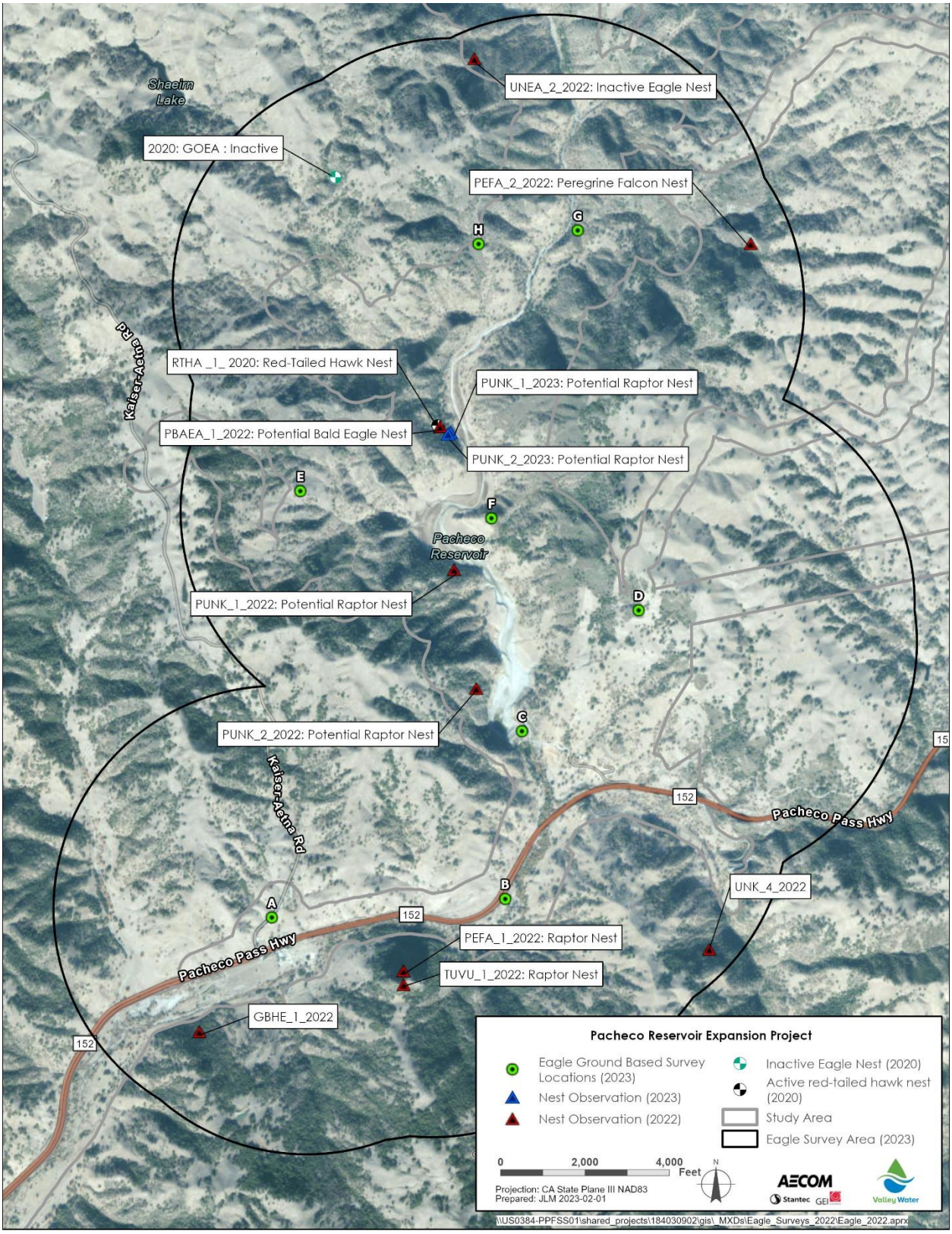
3.3 Other Raptors

Five other raptor species were observed during this first round of the 2023 ground-based eagle surveys, including red-tailed hawk (*Buteo jamaicensis*), red-shouldered hawk (*Buteo lineatus*), peregrine falcon (*Falco peregrinus*), American kestrel (*Falco sparverius*), and turkey vulture (*Cathartes aura*). Two potential raptor-sized nests (PUNK_1_2023 and PUNK_2_2023) were observed along the west side of Pacheco Reservoir. Both nests are in very close proximity to raptor nest PUNK_1_2020 and PBAEA_1_2022, identified during the survey efforts in 2022. Based on the location of the surveyor when the nests were mapped (i.e., estimating location from the east side of the reservoir), there is a potential these are the same nests or belong to the same individual(s), particularly given the territoriality of nesting raptors. One red-tailed hawk was observed perched in the vicinity of both nests. No other raptor nests were observed during this round of surveys.

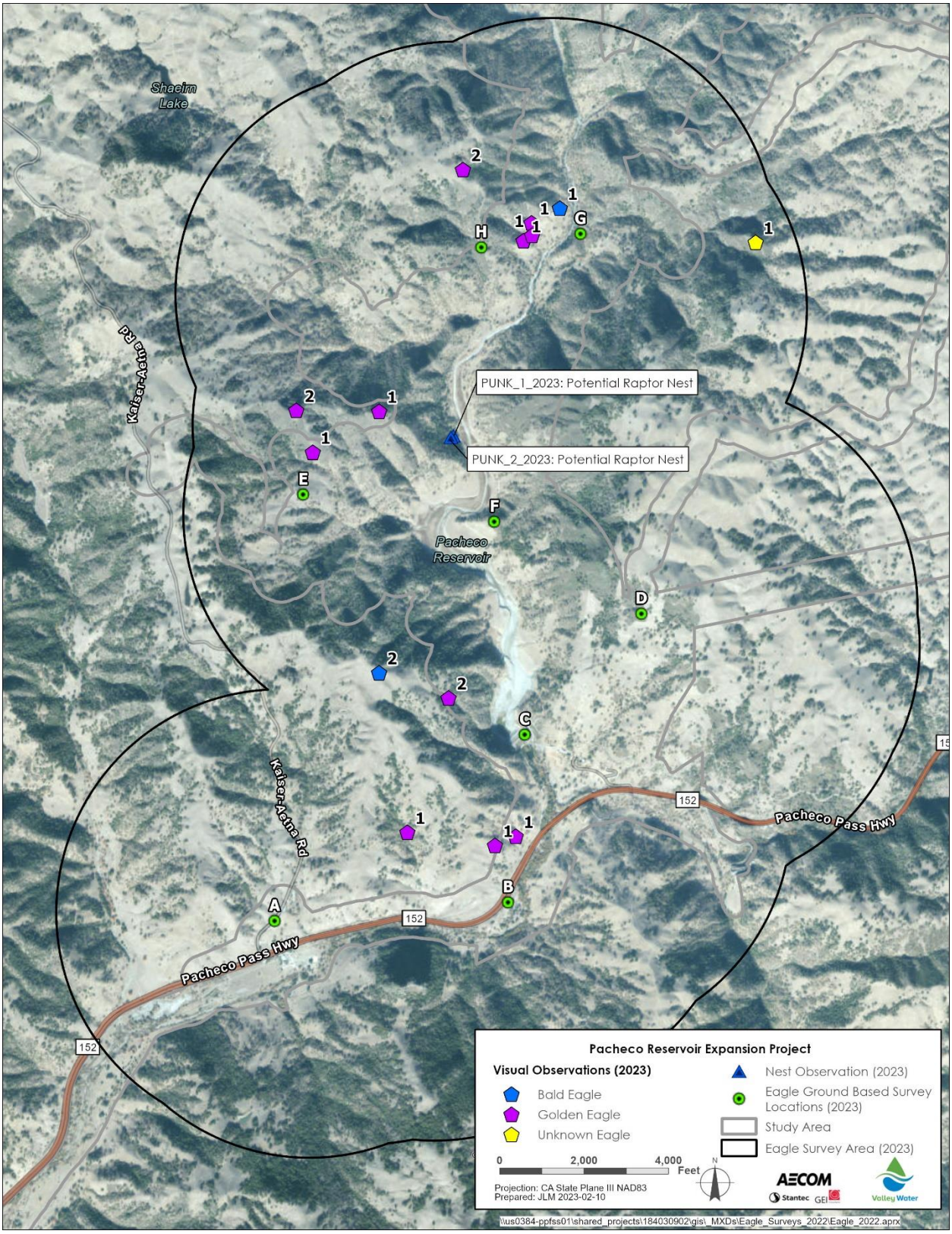
Chapter 4. Discussion

This first round of ground-based eagle surveys yielded three observations of bald eagles and 14 observations of golden eagles and provided preliminary information on eagle use of the study area and vicinity. Observations in 2023 were less than observations from previous survey years. This may be a result of the 2023 survey being conducted in January, which is one month earlier than the 2022 survey. The survey area also experienced inclement weather prior to the 2023 survey which may be a factor as well. Observed behaviors indicate the surveys were conducted during the early breeding and courtship period. Future 2023 eagle survey efforts are expected to provide more information on eagle use, nest locations, and nesting success within the study area and vicinity.

Eagle Survey Technical Memorandum – Figures



Attachment A, Figure 1. Survey Point Locations and Past Nest Observations



Attachment A, Figure 2. Eagle Observations and Nest Locations

Final Draft



Eagle Survey Technical Memorandum

April 2023 Ground-Based Eagle Surveys

July 2023

Prepared by:

AECOM

Stantec GEI Consultants

Prepared for:

Valley Water

Valley Water Project Number: 91954002

Quality Information

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0	4/27/2023	Preliminary Draft	Yes	Mark Noyes	Senior Ecologist
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2	5/26/2023	Final Draft	Yes	Mark Noyes	Senior Ecologist
3	7/05/2023	Final Draft	Yes	Mark Noyes	Senior Ecologist

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Acronyms and Abbreviations

Project	Pacheco Reservoir Expansion Project
Stantec	Stantec Consulting Services, Inc.
Valley Water	Santa Clara Valley Water District
Workplan	Draft Workplan for Nesting Bald and Golden Eagle Surveys

Chapter 1. Introduction

On behalf of the Santa Clara Valley Water District (Valley Water) and AECOM, Stantec Consulting Services Inc. (Stantec) biologists conducted the second-round of 2023 ground-based eagle surveys for Valley Water's Pacheco Reservoir Expansion Project (Project) to support AECOM's proposed 2023 geotechnical investigations. The survey was conducted during the week of April 3, 2023, to coincide with the eagle incubation and nesting period, and followed the methods provided in the January 2020 *Draft Workplan for Nesting Bald and Golden Eagle Surveys* (Workplan) for the Project. This memorandum summarizes the results of the April 2023 ground-based surveys.

Chapter 2. Methods

The second-round of 2023 ground-based eagle surveys was conducted by Stantec biologists on April 3, 4, and 5, 2023. The surveys coincided with the incubation and nesting period for both eagle species, bald eagle (*Haliaeetus leucocephalus*) and golden eagle (*Aquila chrysaetos*). These surveys were conducted at eight ground-based survey points that were selected in conjunction with Valley Water within the area surrounding the proposed 2023 geotechnical investigation sites (study area). These survey points coincided with those used for the first round of 2023 surveys. The survey point locations were chosen to provide visual coverage of the proposed geotechnical investigation sites, where accessible. A map illustrating the survey point locations is provided as Attachment A, Figure 1. The survey team included three experienced biologists with sufficient eagle survey experience to recognize each species, including juveniles, and the survey was conducted as described in the Workplan. Binoculars and spotting scopes were used to identify eagles (e.g., Nikon binoculars with 10x42 magnification). Data was collected on cell phones and/or iPads using ESRI ArcGIS Field Maps software. Approximately 4 hours of survey time was spent at each survey point. All surveys were conducted during suitable weather conditions (i.e., times of rain, high winds, and fog were avoided). Visibility was good (i.e., 1 mile or greater visibility); and sky conditions were clear. Air temperatures ranged from 34 to 56 degrees Fahrenheit, and wind conditions were calm (0-1 mile per hour).

Chapter 3. Results

A total of seven (7) bald eagle and 27 golden eagle observations were made within the study area over the 3-day period during the second round of 2023 ground-based eagle surveys. Additionally, four eagles were observed within the study area that could not be identified by species due to observational circumstances (e.g., distance from observer, difficult lighting). No potential inactive or active eagle nests were detected. Nests identified during past survey efforts in prior years are depicted in Attachment A, Figure 1. Aerial surveys planned for 2023 were cancelled, due to cancellation of geotechnical work planned for 2023. The results of this survey are further summarized below by species, and a map depicting the approximate locations of observed eagles and potential nest locations is provided as Attachment A, Figure 2.

3.1 Bald Eagles

Seven observations of bald eagles were made during the 3-day survey period in April 2023; three observations of adult bald eagles and four observations of juvenile bald eagles. Bald eagle observations were made from survey points C, F, H, and one incidental observation. Three of the observations were of bald eagles perched in trees or on rock outcrops. The other observations were of bald eagles flying near survey point C and potentially foraging near survey point H (Figure 2).

3.2 Golden Eagles

Twenty-seven (27) separate observations of golden eagles were made during the 3-day survey period in April 2023, including 18 observations of adult golden eagles, 5 observations of juvenile golden eagles, and four of unknown age. Golden eagles were observed from all survey points. Golden eagle behaviors observed were primarily flying and soaring, including three observations of pairs flying together. In addition, two golden eagles were observed perched in trees (Figure 2).

During a Swainson's hawk (*Buteo swainsonii*) survey conducted within the same study area on April 14, 2023, a golden eagle was observed approximately 750 feet southwest of survey point H carrying nest building materials (i.e., twigs). The individual flew between 0.5 and 1 mile west before flying over a ridge and out of sight of the surveyor. The observed flight path of this eagle appeared to be in the general direction towards nest "GOEA: 2020: Inactive," an inactive golden eagle nest observed during 2020 aerial surveys (Figures 2 and 3).

3.3 Other Raptors

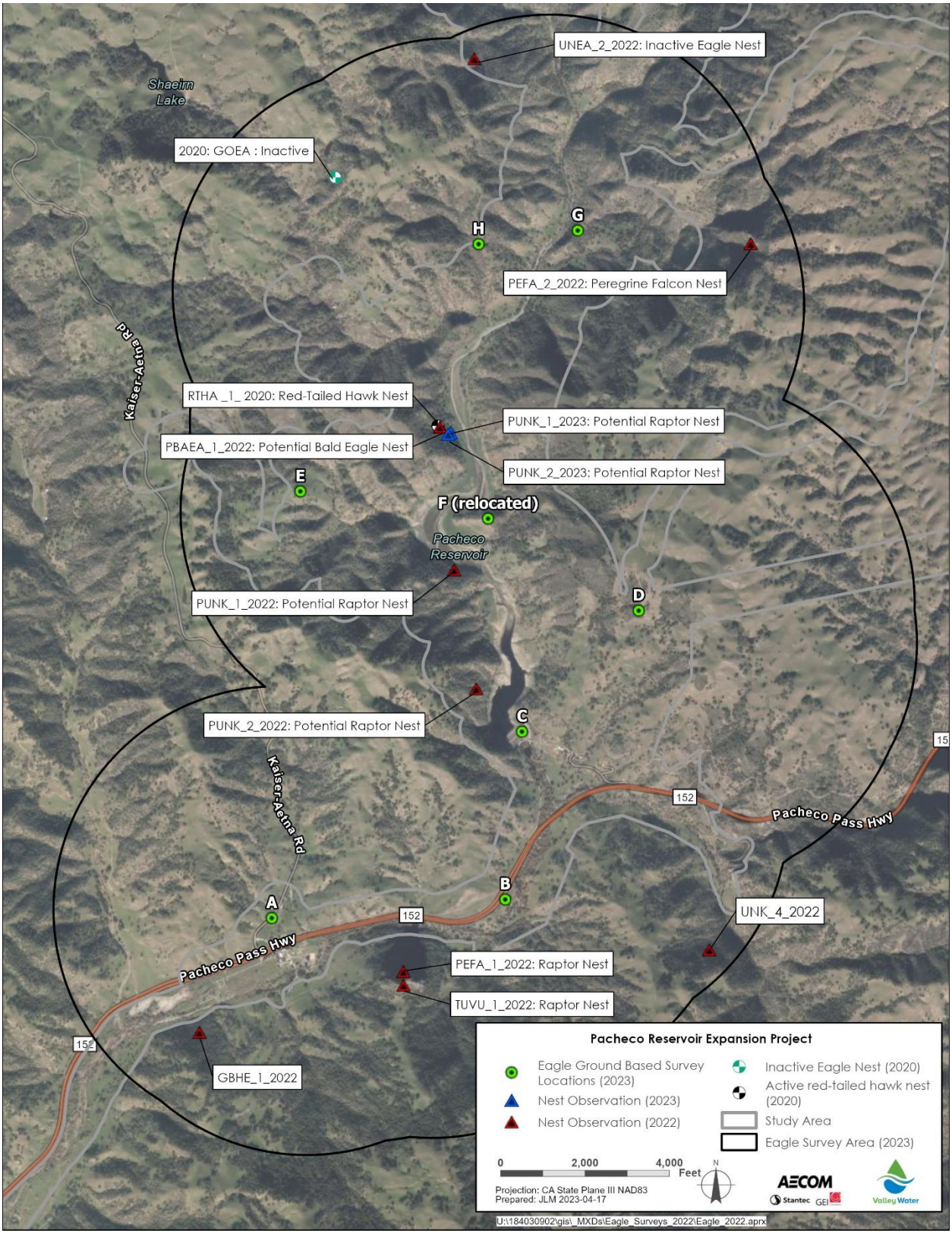
Six other raptor species were observed during this second round of the 2023 ground-based eagle surveys, including red-tailed hawk (Buteo jamaicensis), red-shouldered hawk (Buteo lineatus), American kestrel (Falco sparverius), Cooper's hawk (Accipiter cooperii), sharp-shinned hawk (Accipiter striatus), and turkey vulture (Cathartes aura). Two potential raptor-sized nests (PUNK_1_2023 and PUNK_2_2023) were observed along the west side of Pacheco Reservoir. Both nests are in very close proximity to raptor nest RTHA_1_2020 and PBAEA_1_2022, identified during the ground-based survey efforts in 2022. Based on the location of the surveyor when the nests were mapped (i.e., estimating location from the east side of the reservoir), there is a potential these are the same nests or belong to the same individual(s), particularly given the territoriality of nesting raptors. One bald eagle was observed

perched in a tree in the vicinity of both nests. However, the individual bald eagle did not exhibit any nesting or territorial nesting behaviors. No other raptor nests were observed during this round of surveys.

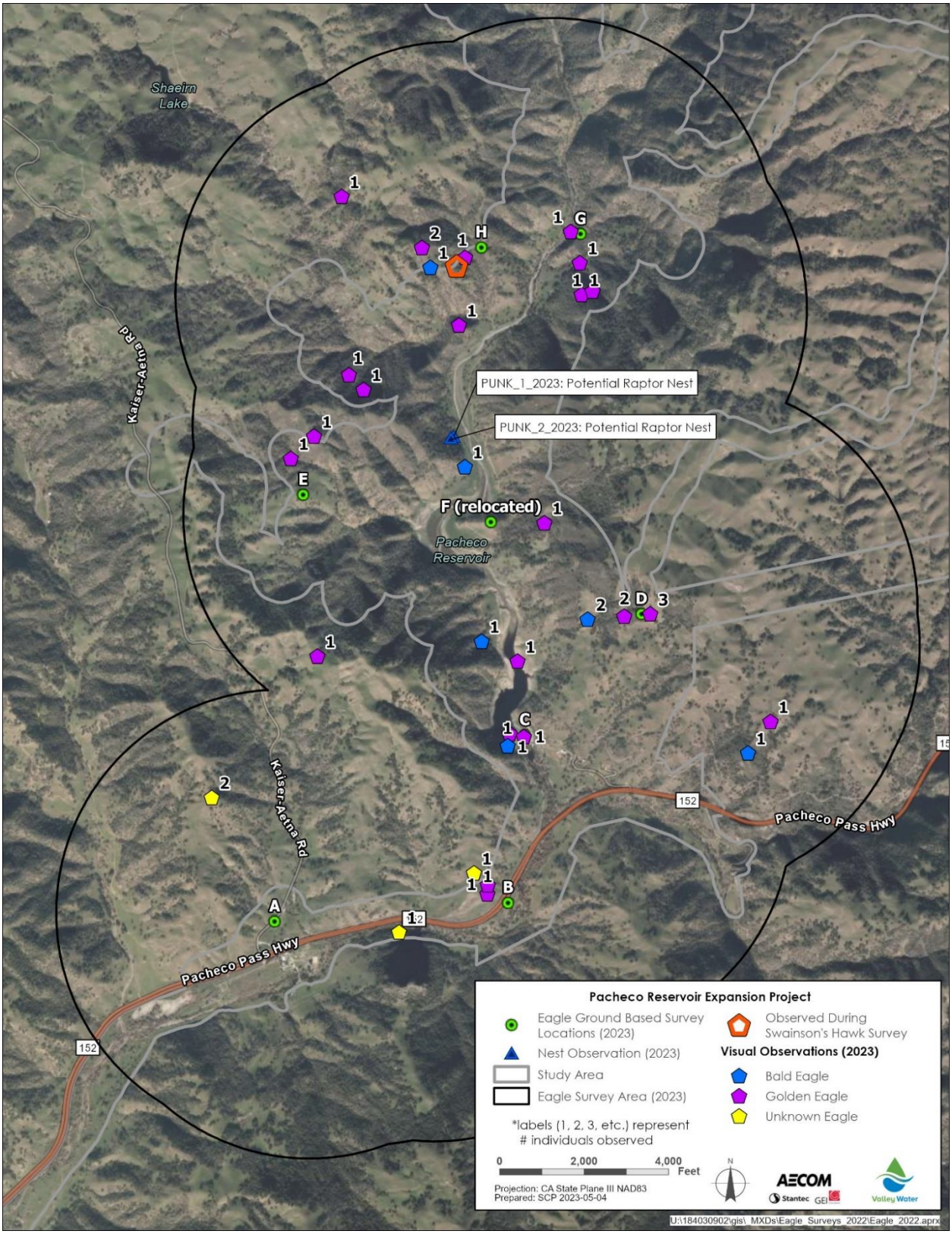
Chapter 4. Discussion

This second round of ground-based eagle surveys yielded 7 observations of bald eagles and 27 observations of golden eagles and provides additional information on eagle use of the study area and vicinity. Observed behaviors (i.e., individuals perched and soaring solo within territory) indicate the surveys were conducted during the incubation and nesting period. During a subsequent Swainson's hawk survey, a golden eagle was observed carrying nest-building materials in the study area. Following an analysis of the topography in individual's flight path, a more targeted survey will be conducted in June to determine whether the nest under construction is located in the study area or if the eagle is utilizing one of the previously-identified nests from 2020 and 2022 surveys that were originally observed to be inactive (Figure 3).

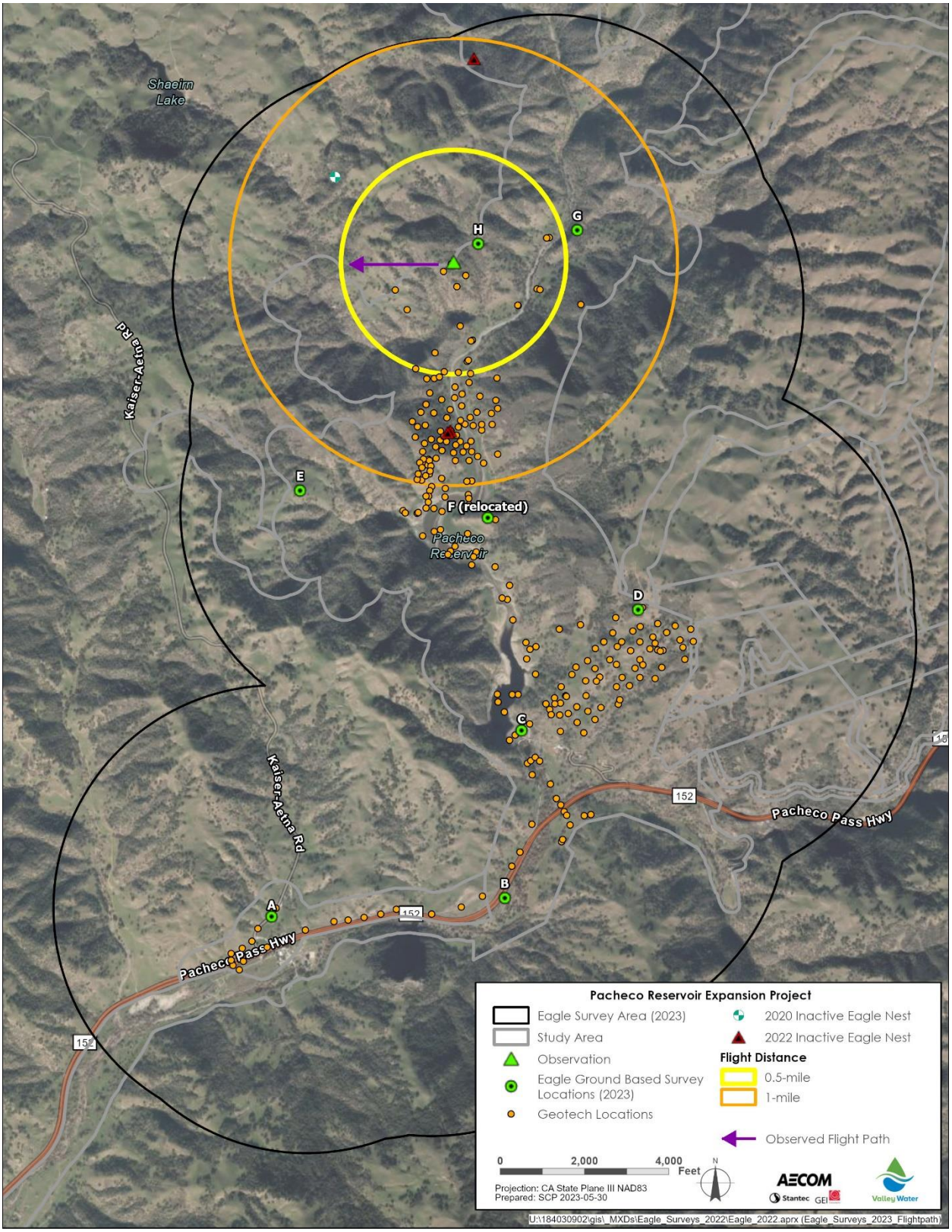
Eagle Survey Technical Memorandum – Figures



Attachment A, Figure 1. Survey Point Locations and Nest Observations



Attachment A, Figure 2. Eagle Observations and Nest Locations



Attachment A, Figure 3. Golden Eagle with Nesting Materials in Relation to Geotechnical Investigation Sites

Final Draft



Eagle Survey Technical Memorandum

June 2023 Ground-Based Eagle Surveys

July 2023

Prepared by:

AECOM

Stantec GEI Consultants

Prepared for:

Valley Water

Valley Water Project Number: 91954002

Quality Information

Prepared By	Checked By	Verified By	Approved By
Chariss Femino	Mark Noyes	Paul Uncapher	Mary Paasch

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0	6/30/23	Preliminary Draft	Yes	Mark Noyes	Senior Ecologist
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3.3 Other Raptors 3
Chapter 4. Discussion 4

Attachments

Attachment A – Figures

Acronyms and Abbreviations

Project	Pacheco Reservoir Expansion Project
Stantec	Stantec Consulting Services, Inc.
study area	Eagle survey area consisting of Survey Points A-H established around geotechnical investigation areas
Valley Water	Santa Clara Valley Water District
Workplan	Draft Workplan for Nesting Bald and Golden Eagle Surveys

Chapter 1. Introduction

On behalf of the Santa Clara Valley Water District (Valley Water) and AECOM, Stantec Consulting Services Inc. (Stantec) biologists conducted the third-round of 2023 ground-based eagle surveys for Valley Water's Pacheco Reservoir Expansion Project (Project) to support AECOM's proposed 2023 geotechnical investigations. The survey was conducted during the week of June 19, 2023, to coincide with the eagle nest outcome period, and followed the methods provided in the January 2020 *Draft Workplan for Nesting Bald and Golden Eagle Surveys* (Workplan) for the Project. This memorandum summarizes the results of the June 2023 ground-based surveys.

Chapter 2. Methods

The third-round of 2023 ground-based eagle surveys was conducted by Stantec biologists on June 20, 21, and 22, 2023. The surveys coincided with the nest outcome period for both eagle species, bald eagle (*Haliaeetus leucocephalus*) and golden eagle (*Aquila chrysaetos*). This survey was performed in response to a golden eagle observed carrying nesting material during the April 2023 ground-based eagle survey. A focused eagle survey area was created based on the location of this observation in relation to the previously identified 2020 inactive golden eagle nest and the 2022 inactive eagle nest (Attachment A, Figure 1). Two new ground survey points (J and K) were added at the request of Valley Water at locations where surveyors had pedestrian access to visual vantage points of the previously identified nests and vicinity. A third new ground survey point (I) was established along Kaiser-Aetna Road based on visibility of the southern portion of the focused eagle survey area.

Survey data were also collected at the eight ground-based survey points (A-H) that were selected in conjunction with Valley Water within the area surrounding the proposed 2023 geotechnical investigation sites (study area). These survey points coincided with those used for the first and second rounds of 2023 surveys. The survey point locations were chosen to provide visual coverage of the proposed geotechnical investigation sites, where accessible. A map illustrating the survey point locations is provided as Attachment A, Figure 1.

The survey team included two experienced biologists with sufficient eagle survey experience to recognize each species, including juveniles, and the survey was conducted as described in the Workplan. Binoculars and spotting scopes were used to identify eagles (e.g., Nikon binoculars with 10x42 magnification). Data was collected on cell phones and/or iPads using ESRI ArcGIS Field Maps software. Approximately 1 hour of survey time was spent at each survey point. All surveys were conducted during suitable weather conditions (i.e., times of rain, high winds, and fog were avoided). Visibility was good (i.e., 1 mile or greater visibility); and sky conditions were clear. Air temperatures ranged from 51 to 78 degrees Fahrenheit, and wind conditions ranged from calm (0-1 mile per hour) to light breeze (4-9 miles per hour) with wind gusts ranging from 19-24 miles per hour.

Chapter 3. Results

A total of six bald eagle and two golden eagle observations were made within the study area over the 3-day period during the third round of ground-based eagle surveys. No potential inactive or active eagle nests were detected. No eagle activity was observed in the vicinity of either previously identified nests within the focused eagle survey area. Other nests identified during past survey efforts in prior years are depicted in Attachment A, Figure 1. Aerial surveys planned for 2023 were cancelled, due to cancellation of geotechnical work planned for 2023. The results of this survey are further summarized below by species, and a map depicting the approximate locations of observed eagles is provided as Attachment A, Figure 2.

3.1 Bald Eagles

Six observations of bald eagles were made during the 3 days of surveying, including three observations of adult bald eagles and three observations of juvenile bald eagles. Four bald eagle observations were made from survey points B, C, and D; two additional incidental observations not associated with survey points were also documented. All the observations were of bald eagles soaring or flying (Attachment A, Figure 2).

3.2 Golden Eagles

Two separate observations of adult golden eagles were made during the 3 days of surveying. One golden eagle was observed from survey point G and an additional incidental observation occurred at the eastern edge of the focused eagle survey area. Both golden eagles were observed soaring. (Attachment A, Figure 2).

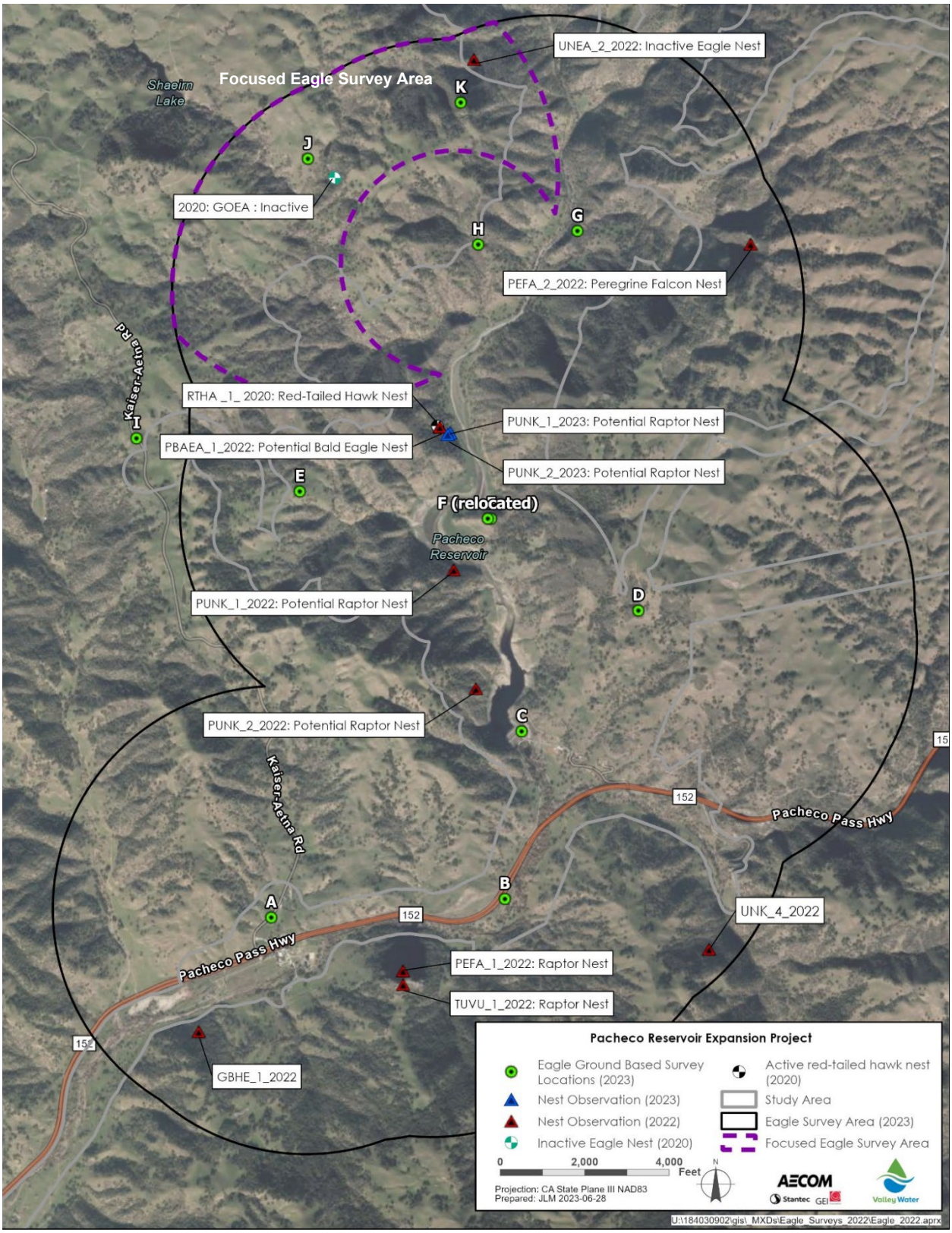
3.3 Other Raptors

Five other raptor species in flight were observed during this third round of the 2023 ground-based eagle surveys, including red-tailed hawk (*Buteo jamaicensis*), red-shouldered hawk (*Buteo lineatus*), peregrine falcon (*Falco peregrinus*), American kestrel (*Falco sparverius*), and turkey vulture (*Cathartes aura*). No other raptor nests were observed during this round of surveys.

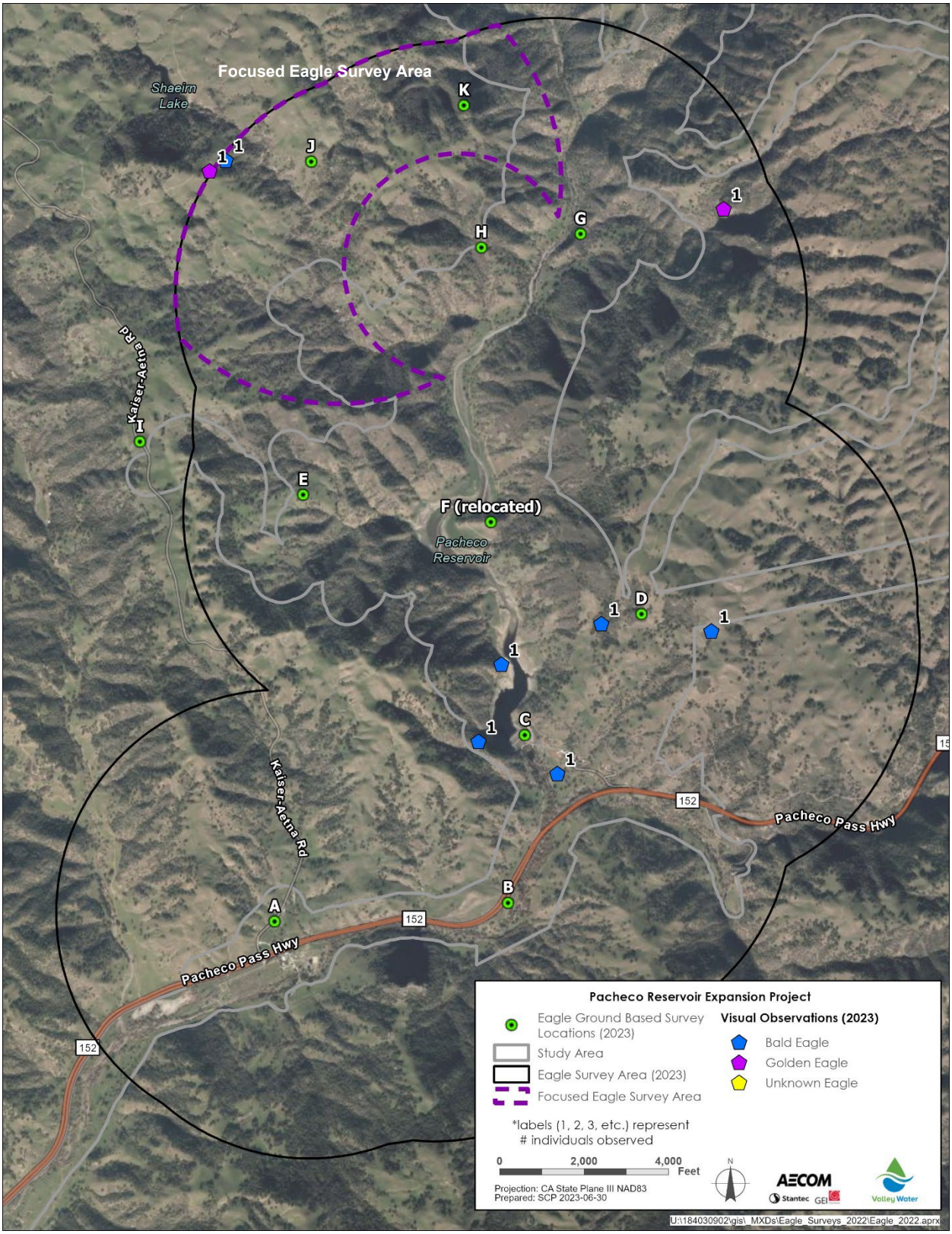
Chapter 4. Discussion

This third round of ground-based eagle surveys yielded six observations of bald eagles and two observations of golden eagles and provides additional information on eagle use of the study area and vicinity. No active eagle nests were detected during this third round of ground-based eagle survey nor during the prior two rounds of ground-based nesting eagle surveys conducted in 2023.

Eagle Survey Technical Memorandum – Figures



Attachment A, Figure 1. Survey Point Locations and Nest Observations



Attachment A, Figure 2. Eagle Observations and Nest Locations

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

Public Draft Initial Study/Mitigated Negative Declaration

Appendix E:

Cultural Resources Information

(Confidential – Not For Public Disclosure)

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

Public Draft Initial Study/Mitigated Negative Declaration

Appendix F:

ERIS Physical Setting Database Report

ENVIRONMENTAL RISK INFORMATION SERVICES

DATABASE REPORT

Project Property:	*Pacheco Dam* *Pacheco Dam* *Pacheco Creek CA 95023*
Project No:	*184030902 task 006.061.6.*
Report Type:	*Database Report*
Order No:	*21012500379*
Requested by:	*Stantec Consulting Ltd.*
Date Completed:	*January 26, 2021*

Environmental Risk Information Services
A division of Glacier Media Inc.
1.866.517.5204 | info@erisinfo.com | erisinfo.com

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Executive Summary

Property Information:

Project Property:		*Pacheco Dam* *Pacheco Dam Pacheco Creek CA 95023*
Project No:		*184030902 task 006.061.6.*
Coordinates:		
	Latitude:	*36.9771708*
	Longitude:	*-121.4602147*
	UTM Northing:	*4,107,402.53*
	UTM Easting:	*650,919.78*
	UTM Zone:	*UTM Zone 10S*
Elevation:		*1,224 FT*

Order Information:

Order No:	*21012500379*
Date Requested:	*January 25, 2021*
Requested by:	*Stantec Consulting Ltd.*
Report Type:	*Database Report*

Historicals/Products:

Aerial Photographs	*Historical Aerials (Boundaries)*
City Directory Search	*CD - 2 Street Search*
ERIS Xplorer	*ERIS Xplorer*
Excel Add-On	*Excel Add-On*
Fire Insurance Maps	*US Fire Insurance Maps*
Physical Setting Report (PSR)	*Physical Setting Report (PSR)*
Topographic Map	*Topographic Maps*

Executive Summary: Report Summary

Database	Searched	Search Radius	Project Property	Within 0.12mi	0.125mi to 0.25mi	0.25mi to 0.50mi	0.50mi to 1.00mi	Total
Standard Environmental Records								
Federal								
FRP	Y	0.25	0	0	0	-	-	0
NPL	Y	1	0	0	0	0	0	0
PROPOSED NPL	Y	1	0	0	0	0	0	0
DELETED NPL	Y	0.5	0	0	0	0	-	0
SEMS	Y	0.5	0	0	0	0	-	0
ODI	Y	0.5	0	0	0	0	-	0
SEMS ARCHIVE	Y	0.5	0	0	0	0	-	0
CERCLIS	Y	0.5	0	0	0	0	-	0
IODI	Y	0.5	0	0	0	0	-	0
CERCLIS NFRAP	Y	0.5	0	0	0	0	-	0
CERCLIS LIENS	Y	PO	0	-	-	-	-	0
RCRA CORRACTS	Y	1	0	0	0	0	0	0
RCRA TSD	Y	0.5	0	0	0	0	-	0
RCRA LQG	Y	0.25	0	0	0	-	-	0
RCRA SQG	Y	0.25	0	0	0	-	-	0
RCRA VSQG	Y	0.25	0	0	0	-	-	0
RCRA NON GEN	Y	0.25	0	**1**	0	-	-	**1**
FED ENG	Y	0.5	0	0	0	0	-	0
FED INST	Y	0.5	0	0	0	0	-	0
ERNS 1982 TO 1986	Y	PO	0	-	-	-	-	0
ERNS 1987 TO 1989	Y	PO	0	-	-	-	-	0
ERNS	Y	PO	0	-	-	-	-	0
FED BROWNFIELDS	Y	0.5	0	0	0	0	-	0
FEMA UST	Y	0.25	0	0	0	-	-	0
REFN	Y	0.25	0	0	0	-	-	0
BULK TERMINAL	Y	0.25	0	0	0	-	-	0
SEMS LIEN	Y	PO	0	-	-	-	-	0

Database	Searched	Search Radius	Project Property	Within 0.12mi	0.125mi to 0.25mi	0.25mi to 0.50mi	0.50mi to 1.00mi	Total
SUPERFUND ROD	Y	1	0	0	0	0	0	0
State								
RESPONSE	Y	1	0	0	0	0	0	0
ENVIROSTOR	Y	1	0	0	0	0	0	0
DELISTED ENVS	Y	1	0	0	0	0	0	0
SWF/LF	Y	0.5	0	0	0	0	-	0
HWP	Y	1	0	0	0	0	0	0
SWAT	Y	0.5	0	0	0	0	-	0
LDS	Y	0.5	0	0	0	0	-	0
LUST	Y	0.5	0	0	**1**	0	-	**1**
DELISTED LST	Y	0.5	0	0	0	0	-	0
SWRCB SWF	Y	0.5	0	0	0	0	-	0
UST	Y	0.25	0	0	0	-	-	0
UST CLOSURE	Y	0.5	0	0	0	0	-	0
HHSS	Y	0.25	0	0	0	-	-	0
AST	Y	0.25	0	0	0	-	-	0
AST SWRCB	Y	0.25	0	0	0	-	-	0
TANK OIL GAS	Y	0.25	0	0	0	-	-	0
DELISTED TNK	Y	0.25	0	0	0	-	-	0
CERS TANK	Y	0.25	0	0	0	-	-	0
LUR	Y	0.5	0	0	0	0	-	0
HLUR	Y	0.5	0	0	0	0	-	0
DEED	Y	0.5	0	0	0	0	-	0
VCP	Y	0.5	0	0	0	0	-	0
CLEANUP SITES	Y	0.5	0	0	0	0	-	0
DELISTED COUNTY	Y	0.25	0	0	0	-	-	0
DELISTED CTNK	Y	0.25	0	0	0	-	-	0
HIST TANK	Y	0.25	0	0	0	-	-	0
Tribal								
INDIAN LUST	Y	0.5	0	0	0	0	-	0
INDIAN UST	Y	0.25	0	0	0	-	-	0
DELISTED ILST	Y	0.5	0	0	0	0	-	0
DELISTED IUST	Y	0.25	0	0	0	-	-	0
County								

Database	Searched	Search Radius	Project Property	Within 0.12mi	0.125mi to 0.25mi	0.25mi to 0.50mi	0.50mi to 1.00mi	Total
MERCED CUPA	Y	0.25	0	**1**	0	-	-	**1**
SANTACLARA HSOL	Y	0.5	0	0	0	0	-	0
SANTACLARA LO	Y	0.5	0	0	0	0	-	0
UST SANTACLARA	Y	0.25	0	0	0	-	-	0
SANTACLARA CUPA	Y	0.25	0	**1**	**2**	-	-	**3**
SANJOSE HM	Y	0.25	0	0	0	-	-	0
GILROY CUPA	Y	0.25	0	**1**	0	-	-	**1**
SUNNYVALE CUPA	Y	0.25	0	0	0	-	-	0
STANISLAUS CUPA	Y	0.25	0	0	0	-	-	0

Additional Environmental Records

Federal

PFAS NPL	Y	0.5	0	0	0	0	-	0
FINDS/FRS	Y	PO	0	-	-	-	-	0
TRIS	Y	PO	0	-	-	-	-	0
PFAS TRI	Y	0.5	0	0	0	0	-	0
PFAS WATER	Y	0.5	0	0	0	0	-	0
HMIRS	Y	0.125	0	0	-	-	-	0
NCDL	Y	0.125	0	0	-	-	-	0
TSCA	Y	0.125	0	0	-	-	-	0
HIST TSCA	Y	0.125	0	0	-	-	-	0
FTTS ADMIN	Y	PO	0	-	-	-	-	0
FTTS INSP	Y	PO	0	-	-	-	-	0
PRP	Y	PO	0	-	-	-	-	0
SCRD DRYCLEANER	Y	0.5	0	0	0	0	-	0
ICIS	Y	PO	0	-	-	-	-	0
FED DRYCLEANERS	Y	0.25	0	0	0	-	-	0
DELISTED FED DRY	Y	0.25	0	0	0	-	-	0
FUDS	Y	1	0	0	0	0	0	0
PIPELINE INCIDENT	Y	PO	0	-	-	-	-	0
MLTS	Y	PO	0	-	-	-	-	0
HIST MLTS	Y	PO	0	-	-	-	-	0
MINES	Y	0.25	0	0	0	-	-	0
ALT FUELS	Y	0.25	0	0	0	-	-	0
SSTS	Y	0.25	0	0	0	-	-	0
PCB	Y	0.5	0	0	0	0	-	0

Database	Searched	Search Radius	Project Property	Within 0.12mi	0.125mi to 0.25mi	0.25mi to 0.50mi	0.50mi to 1.00mi	Total
State								
DRYCLEANERS	Y	0.25	0	0	0	-	-	0
DELISTED DRYCLEANERS	Y	0.25	0	0	0	-	-	0
DRYC GRANT	Y	0.25	0	0	0	-	-	0
PFAS	Y	0.5	0	0	0	0	-	0
PFAS GW	Y	0.5	0	0	0	0	-	0
HWSS CLEANUP	Y	0.5	0	0	0	0	-	0
DTSC HWF	Y	0.5	0	0	0	0	-	0
INSP COMP ENF	Y	1	0	0	0	0	0	0
SCH	Y	1	0	0	0	0	0	0
CHMIRS	Y	PO	0	-	-	-	-	0
HAZNET	Y	PO	0	-	-	-	-	0
HIST CHMIRS	Y	PO	0	-	-	-	-	0
HIST MANIFEST	Y	PO	0	-	-	-	-	0
HIST CORTESE	Y	0.5	0	0	0	0	-	0
CDO/CAO	Y	0.5	0	0	0	0	-	0
CERS HAZ	Y	0.125	0	0	-	-	-	0
DELISTED HAZ	Y	0.5	0	0	0	0	-	0
GEOTRACKER	Y	0.125	0	0	-	-	-	0
WASTE DISCHG	Y	0.25	0	0	0	-	-	0
EMISSIONS	Y	0.25	0	0	0	-	-	0
CDL	Y	0.125	0	0	-	-	-	0
Tribal	***No Tribal additional environmental record sources available for this State.***							
County	***No County additional environmental databases were selected to be included in the search.***							
	Total:		0	**4**	**3**	0	0	**7**

**** PO – Property Only***
**** 'Property and adjoining properties' database search radii are set at 0.25 miles.***

Executive Summary: Site Report Summary - Project Property

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number

No records found in the selected databases for the project property.

Executive Summary: Site Report Summary - Surrounding Properties

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
1	SANTACLARA CUPA	SCVWD-NORTH FORK DAM	17610 PACHECO PASS HY HOLLISTER CA 95023	S	0.02 / 124.12	-775	17
2	GILROY CUPA	T-Mobile West Corporation SF04719A	28890 Pacheco Pass Hwy Gilroy CA 95020	SE	0.07 / 375.29	113	17
3	SANTACLARA CUPA	SPRINT PCS-SF72XC805	38777 DINOSAUR POINT RD HOLLISTER CA 95023	ESE	0.20 / 1,049.81	130	19
3	SANTACLARA CUPA	NEXTEL-SITE CA1511	38777 DINOSAUR POINT RD HOLLISTER CA 94023	ESE	0.20 / 1,049.81	130	19
4	MERCED CUPA	AT&T Mobility - INTERNATIONAL TURBINE RESEARCH (USID79713)	38787 Dinosaur Point Road Santa Nella, CA 95322 CA	ESE	0.12 / 615.27	140	20
4	RCRA NON GEN	CALIFORNIA STATE PARKS PACHECO SP	38787 DINOSAUR POINT RD HOLLISTER CA 95023-9525 ***EPA Handler ID:*** CAL000361493	ESE	0.12 / 615.27	140	20
5	LUST	PACHECO STATE PARK	38778 DINOSAUR POINT GILROY CA 95020 ***Global ID | Status | Status Date:*** T0608531207 | COMPLETED - CASE CLOSED | 1/31/2006	ESE	0.16 / 819.94	157	21

Executive Summary: Summary by Data Source

Standard

Federal

RCRA NON GEN - RCRA Non-Generators

A search of the RCRA NON GEN database, dated Oct 19, 2020 has found that there are 1 RCRA NON GEN site(s) within approximately 0.25 miles of the project property.

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
CALIFORNIA STATE PARKS PACHECO SP	38787 DINOSAUR POINT RD HOLLISTER CA 95023-9525	ESE	0.12 / 615.27	4
	***EPA Handler ID**: CAL000361493*			

State

LUST - Leaking Underground Fuel Tank Reports

A search of the LUST database, dated Nov 16, 2020 has found that there are 1 LUST site(s) within approximately 0.50 miles of the project property.

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
PACHECO STATE PARK	38778 DINOSAUR POINT GILROY CA 95020	ESE	0.16 / 819.94	5
	***Global ID** | **Status** | **Status Date**: T0608531207 | COMPLETED - CASE CLOSED | 1/31/2006*			

County

MERCED CUPA - Merced County - CUPA Facilities List

A search of the MERCED CUPA database, dated Sep 19, 2019 has found that there are 1 MERCED CUPA site(s) within approximately 0.25 miles of the project property.

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
AT&T Mobility - INTERNATIONAL TURBINE RESEARCH (USID79713)	38787 Dinosaur Point Road Santa Nella, CA 95322 CA	ESE	0.12 / 615.27	4

SANTACLARA CUPA - Santa Clara County - CUPA Facilities List

A search of the SANTACLARA CUPA database, dated Dec 9, 2020 has found that there are 3 SANTACLARA CUPA site(s) within approximately 0.25 miles of the project property.

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
SPRINT PCS-SF72XC805	38777 DINOSAUR POINT RD HOLLISTER CA 95023	ESE	0.20 / 1,049.81	3

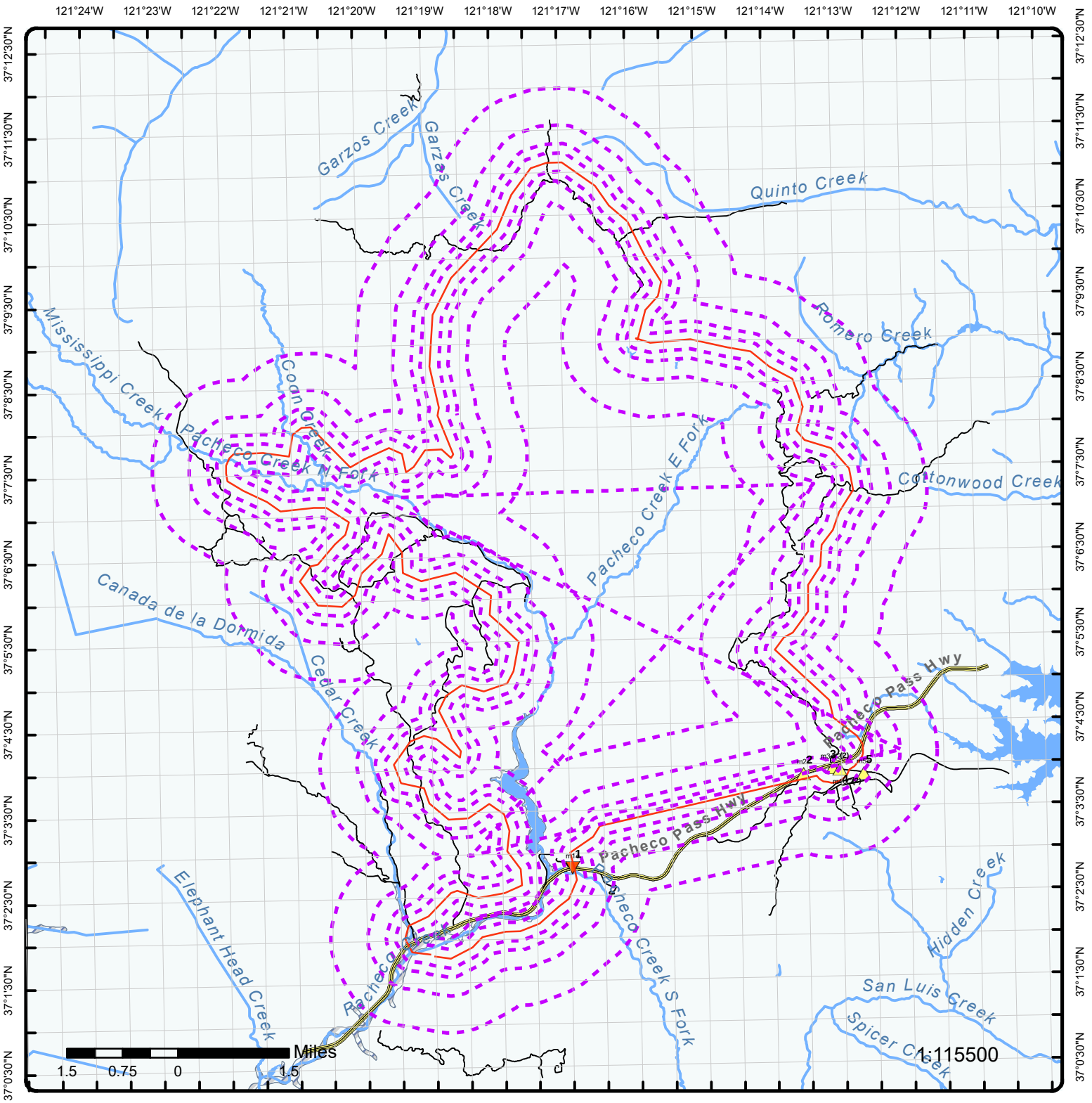
Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
NEXTEL-SITE CA1511	38777 DINOSAUR POINT RD HOLLISTER CA 94023	ESE	0.20 / 1,049.81	3

Lower Elevation	Address	Direction	Distance (mi/ft)	Map Key
SCVWD-NORTH FORK DAM	17610 PACHECO PASS HY HOLLISTER CA 95023	S	0.02 / 124.12	1

GILROY CUPA - Santa Clara County - Gilroy City CUPA Facilities List

A search of the GILROY CUPA database, dated Sep 21, 2020 has found that there are 1 GILROY CUPA site(s) within approximately 0.25 miles of the project property.

Equal/Higher Elevation	Address	Direction	Distance (mi/ft)	Map Key
T-Mobile West Corporation SF04719A	28890 Pacheco Pass Hwy Gilroy CA 95020	SE	0.07 / 375.29	2



Map : 1.0 Mile Radius

Order Number: 21012500379

Address: Pacheco Dam, Pacheco Creek, CA

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

- Project Property
- Buffer Outline
- Eris Sites with Higher Elevation
- Eris Sites with Same Elevation
- Eris Sites with Lower Elevation
- Eris Sites with Unknown Elevation
- County Boundary
- Rails
- Major Highways
- Major Highways Ramps
- Major Roads
- Major Roads Ramps
- Secondary Roads
- Secondary Roads Ramps
- Local Roads and Ramps
- State Boundary
- National Priority List Sites
- National Wetland
- Indian Reserve Land
- Historic Fill
- 100 Year Flood Zone
- 500 Year Flood Zone
- FWS Special Designation Areas
- State Brownfield Sites
- State Brownfield Areas
- State Superfund Areas:Dept. of Defense
- State Superfund Areas:NPL
- WQARF Areas
- Federal Lands: Dept. of Defense (owned/administered areas)

Source: © 2016 ESRI

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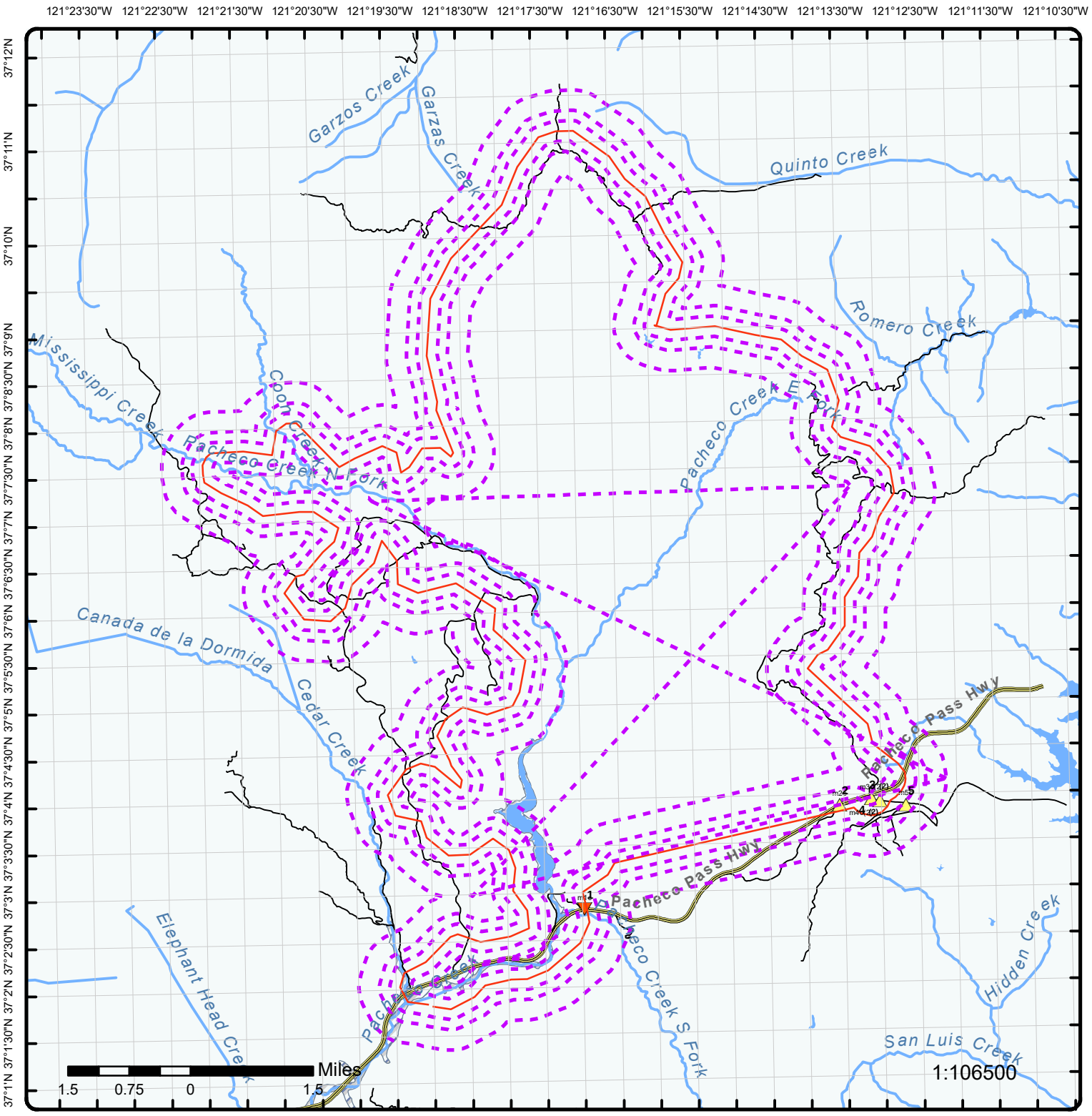

Map : 0.5 Mile Radius

Order Number: 21012500379

Address: Pacheco Dam, Pacheco Creek, CA

ENVIRONMENTAL RISK INFORMATION SERVICES

- Project Property
- Buffer Outline
- Eris Sites with Higher Elevation
- Eris Sites with Same Elevation
- Eris Sites with Lower Elevation
- Eris Sites with Unknown Elevation
- County Boundary
- Rails
- Major Highways
- Major Highways Ramps
- Major Roads
- Major Roads Ramps
- Secondary Roads
- Secondary Roads Ramps
- Local Roads and Ramps
- State Boundary
- National Priority List Sites
- National Wetland
- Indian Reserve Land
- Historic Fill
- 100 Year Flood Zone
- 500 Year Flood Zone
- FWS Special Designation Areas
- State Brownfield Sites
- State Brownfield Areas
- State Superfund Areas:Dept. of Defense
- State Superfund Areas:NPL
- WQARF Areas
- Federal Lands: Dept. of Defense (owned/administered areas)

Source: © 2016 ESRI

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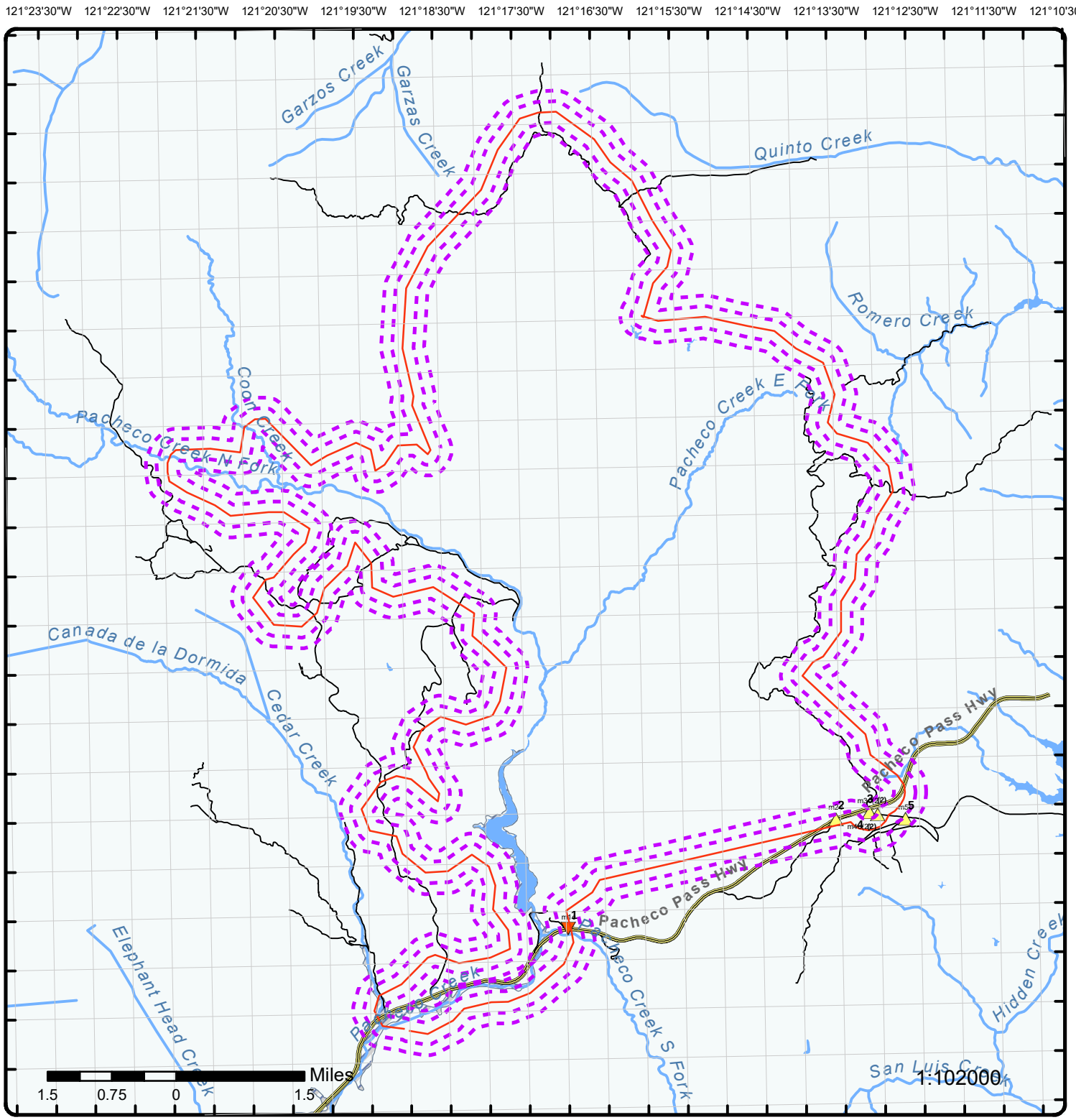

Map : 0.25 Mile Radius

Order Number: 21012500379

Address: Pacheco Dam, Pacheco Creek, CA

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

- Project Property
- Buffer Outline
- Eris Sites with Higher Elevation
- Eris Sites with Same Elevation
- Eris Sites with Lower Elevation
- Eris Sites with Unknown Elevation
- County Boundary
- Rails
- Major Highways
- Major Highways Ramps
- Major Roads
- Major Roads Ramps
- Secondary Roads
- Secondary Roads Ramps
- Local Roads and Ramps
- State Boundary
- National Priority List Sites
- National Wetland
- Indian Reserve Land
- Historic Fill
- 100 Year Flood Zone
- 500 Year Flood Zone
- FWS Special Designation Areas
- State Brownfield Sites
- State Brownfield Areas
- State Superfund Areas:Dept. of Defense
- State Superfund Areas:NPL
- WQARF Areas
- Federal Lands: Dept. of Defense (owned/administered areas)

Source: © 2016 ESRI

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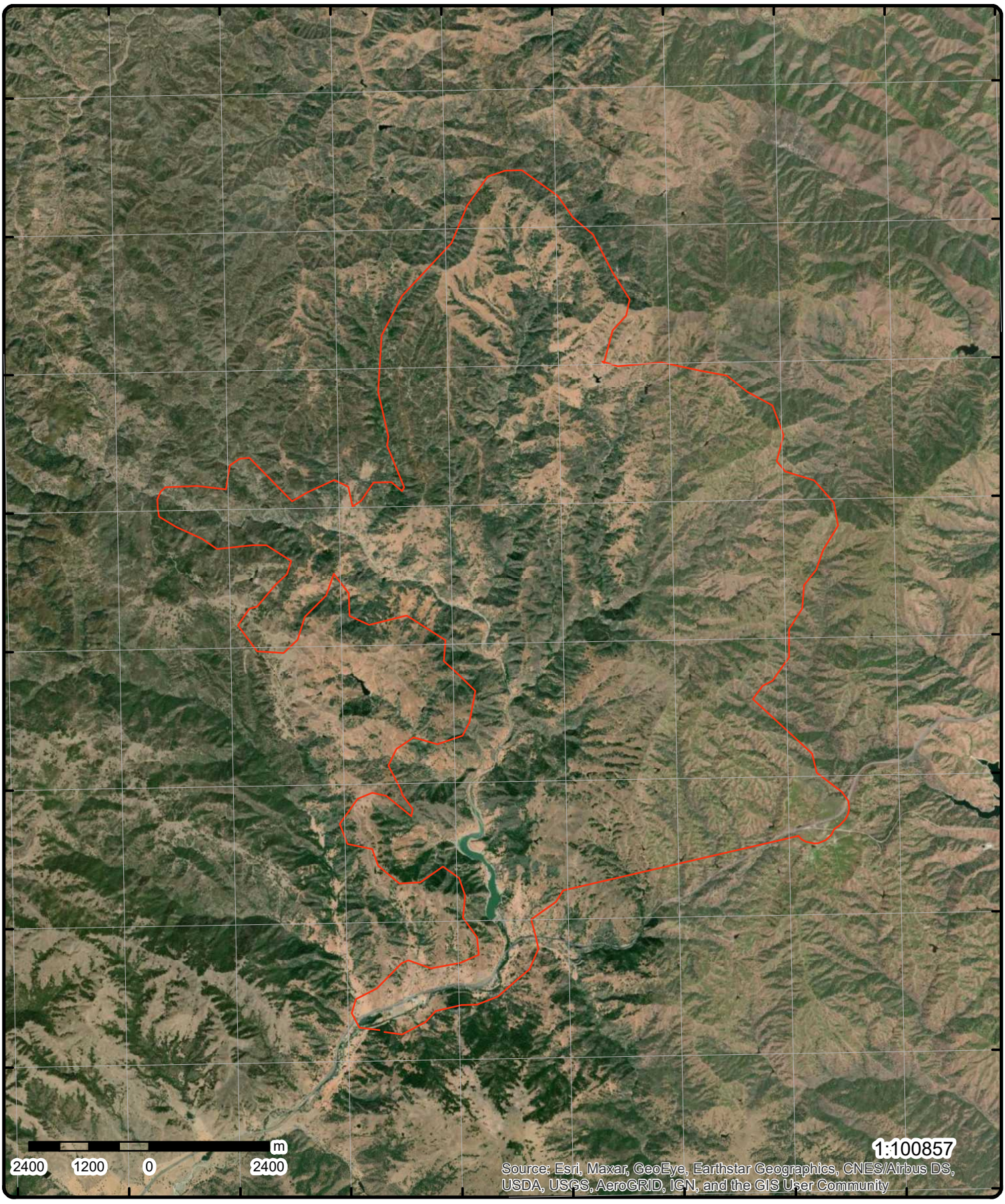

Aerial **Year: 2015**

Address: Pacheco Dam, Pacheco Creek, CA

Source: ESRI World Imagery

Order Number: 21012500379

ENVIRONMENTAL RISK INFORMATION SERVICES

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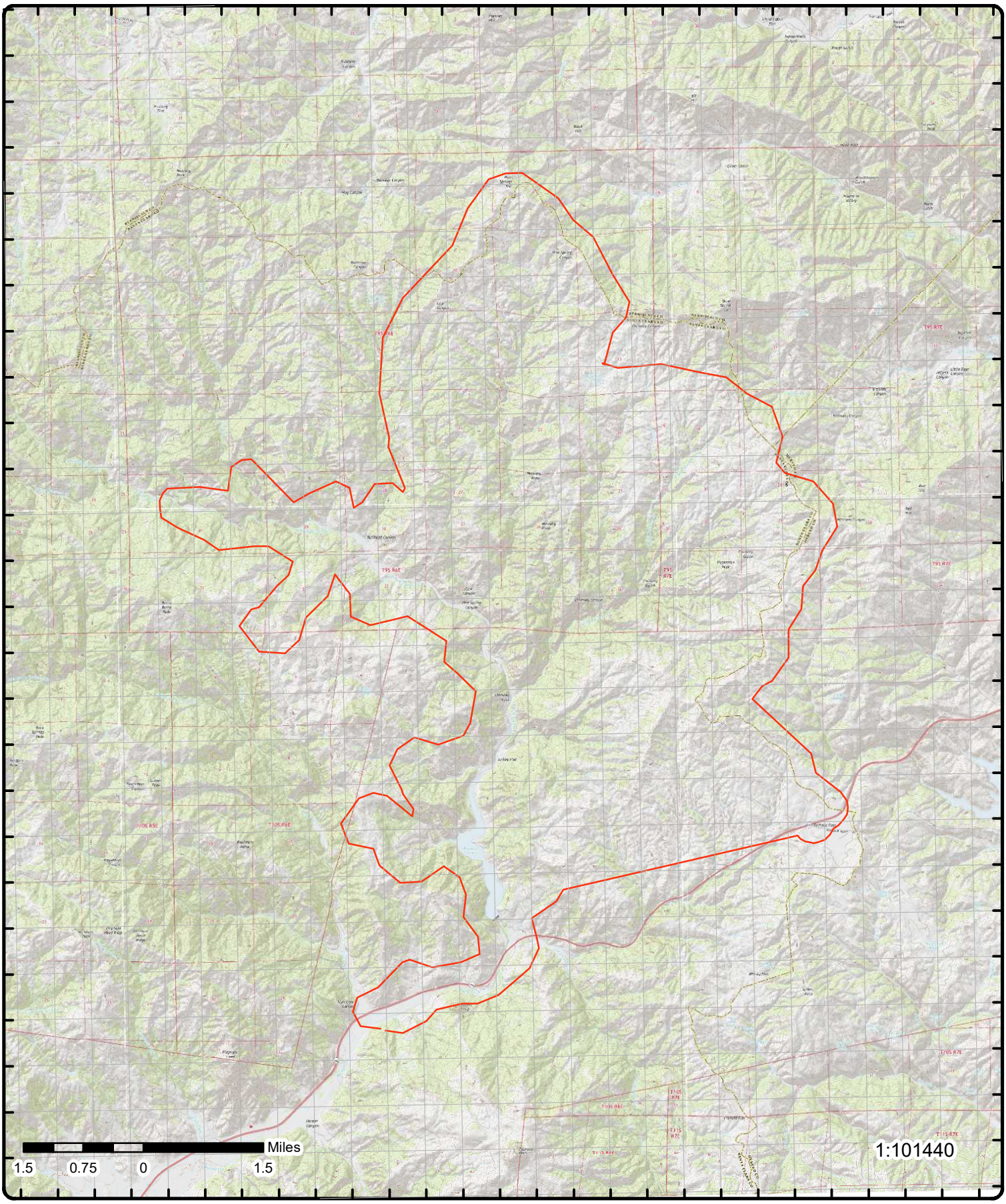

Topographic Map

Year: 2015

Order Number: 21012500379

Address: Pacheco Dam, CA

Quadrangle(s): Mustang Peak,CA; Mississippi Creek,CA; Pacheco Pass,CA; Gilroy Hot Springs,CA; Crevison Peak,CA; Pacheco Pe

© ERIS Information Inc.

Source: USGS Topographic Map

Detail Report

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
1	1 of 1	S	0.02 / 124.12	448.81 / -775	SCVWD-NORTH FORK DAM 17610 PACHECO PASS HY HOLLISTER CA 95023	SANTACLARA CUPA

Facility ID: FA0257034
GIS Latitude: 37.045347
GIS Longitude: -121.265941

Details

Record ID: PR0375542
PE: 2502
Description: HAZMAT STORAGE FACILITY-MINIMAL STORAGE SITE

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
2	1 of 1	SE	0.07 / 375.29	1,337.57 / 113	T-Mobile West Corporation SF04719A 28890 Pacheco Pass Hwy Gilroy CA 95020	GILROY CUPA

CERS ID: 10720354
Facility ID:
Facility Regltr Key:
HM on Site:
HW Generator:
On Site HW Trtmnt:
CALARP Reg Subst:
RCRA Lrg Qnty Gen:
Recycle:
Own/Op UST:
Own/Op PST:
Organization Code: 90128011
Origin: Business
MJB: Yes
Business Name: T-Mobile West, LLC
Cnt of Bus CERS User Accts: 8
Facility Count for Business: 4896
Count of Submitted Elements: 0
Last Submit Dt (Any Element):
Small Quantity Generator Fac: No
Local Facility Grouping:

Remote Facility: No
Fac Info Rpt Req: Not Applicable
Inv Rpt Req: Not Applicable
UST Rpt Req: Not Applicable
RMR Rpt Req: Not Applicable
APSA Rpt Req: Not Applicable
CALARP Rpt Req: Not Applicable
HW Treat Rpt Req: Not Applicable
Consolid Rpt Req: Not Applicable
ER training Rpt Req: Not Applicable
Tank Close Rpt Req: Not Applicable
Latitude Measure: 37.00143
Longitude Measure: -121.52221

Owner/Operator Fields

SIC Code:
NAICS Code:
Dun and Brad Str:
Beginning Date:
Ending Date:
Phone:
Fax:
Operator Name:
Operator Phone:
Owner Name:
Owner Phone:
Owner Mail Address:
Owner City:

SEC Name:
SEC Title:
SEC Business Phone:
SEC 24 Hr Phone:
SEC Pager:
Billing Contact Nm:
Billing Contact Pho:
Billing Contact Eml:
Billing Address:
Billing Adr City:
Billing Adr State:
Billing Adr ZIP Cd:
Billing Adr Country:

Owner State:
Owner ZIP Code:
Owner Country:
Mailing Address:
Mailing Adr City:
Mailing Adr State:
Mailing Adr ZIP Cd:
PEC Name:
PEC Business Phone:
PEC 24 Hr Phone:
PEC Pager:
Owner Opr Reglr Key:
Document Preparer Name:
Identification Signer Name:
Identification Signer Title:
PEC Title:
Identification Signed Date:
AL Collected Info:

EContact Name:
EContact Phone:
EContact Mailing Adr:
EContact Email Adr:
EContact City:
EContact State:
EContact ZIP Code:
EContact Country:
County ID:
Suppl Loc Txt:

Facility Information Local Fields

Assessor Parcel No:
No of Employees:
Property Owner Name:
Property Owner Phone:
Property Owner Mailing Adr:
Property Owner City:
Property Owner State:
Property Owner Country:
Property Owner ZIP Code:

Business Activities

EPAID:
HHW Collection:
HW Tank Closure:
RW Consolidation Site:
Financial Assurance:
Comments:

Submittal Information

Submittal Action:
Submitted Date Time:
BP Activities Last Updated on:
BP Owner Opr Last Updtd on:
Next Due Date Fac Info:
Biz Activities Regulator Key:
Submitter Comments:
Submittal Action Comments:

Supplemental Geographic Data

Geographic Reference Point: Facility Center/Centroid
Horizontal Accuracy Measure: 300
Horizontal Collection Method: Address Matching
Horizontal Reference Datum: WGS84 (World Geodetic System of 1984)
Data Collection Date: 12/15/2016

Submittal Element Regulator Codes

CUPA Code: 4302
Cal ARP Regltr Cd: 4302
RMR Last Accptd Dt:
UST Regulator Code: 4302

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB

Cal ARP Next Due Dt:
APSA Regltr Cd: 4302
APSA Next Due Date:
APSA Lst Submttd Dt:
APSA Last Accptd Dt:
RMR Regulator Code: 4302
RMR Next Due Date:
RMR Last Submttd Dt:
Fac Info Next Due Date:
Fac Info Last Submttd Dt:
Fac Info Last Accepted Date:
Cal ARP Last Submitted Dt:
Cal ARP Last Accepted Dt:
Tank Closure Regulator Cd: 4302
Tank Closure Next Due Dt:
Tank Closure Last Submttd Dt:
Tank Closure Last Accepted Dt:
Invntry Last Submitted Dt:
Inventory Last Accepted Dt:
HW Treat Last Submitted Dt:
HW Treat Last Accepted Dt:
Consolidation Regulator Code: 4302
Consolidation Next Due Date:
Consolidation Last Submttd Dt:
Consolidation Last Accptd Dt:
ER Training Regulator Cd: 4302
ER Training Next Due Dt:
ER Training Last Submitted Dt:
ER Training Last Accepted Dt:

UST Next Due Date:
UST Last Submttd Dt:
UST Last Accptd Dt:
Inventory Regltr Cd: 4302
Invntry Next Due Dt:
HW Treat Regltr Cd: 4302
HW Treat Next Due Dt:

Inspections

Cal ARP Last Inspection Date:
APSA Last Inspection Date:
CA Last Inspection Date:
CE Last Inspection Date:
HHW Last Inspection Date:
HMRRP Last Inspection Date:
HW Last Inspection Date:
HWLQG Last Inspection Date:
HW Rec Last Inspection Date:
PBR Last Inspection Date:
UST Last Inspection Date:

3	*1 of 2*	*ESE*	*0.20 / 1,049.81*	*1,353.72 / 130*	***SPRINT PCS-SF72XC805*** ***38777 DINOSAUR POINT RD*** ***HOLLISTER CA 95023***	***SANTACLARA CUPA***

Facility ID: FA0264368
GIS Latitude: 37.0652935
GIS Longitude: -121.2140049

Details

Record ID: PR0413486
PE: 2502
Description: HAZMAT STORAGE FACILITY-MINIMAL STORAGE SITE

3	*2 of 2*	*ESE*	*0.20 / 1,049.81*	*1,353.72 / 130*	***NEXTEL-SITE CA1511*** ***38777 DINOSAUR POINT RD*** ***HOLLISTER CA 94023***	***SANTACLARA CUPA***

Facility ID: FA0257040
GIS Latitude: 37.065118
GIS Longitude: -121.2138

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB

Details

Record ID: PR0375553
PE: 2502
Description: HAZMAT STORAGE FACILITY-MINIMAL STORAGE SITE

---

4 | ***1 of 2*** | ***ESE*** | ***0.12 / 615.27*** | ***1,364.04 / 140*** | ***AT&T Mobility - INTERNATIONAL TURBINE RESEARCH (USID79713)***
38787 Dinosaur Point Road
Santa Nella, CA 95322 CA | ***MERCED CUPA***

Facility ID: FA0007619
Latitude: 0
Longitude: 0

Detail(s)

Account ID: AR0013848
Permit No:
Units: 13
Phone: 8006382822
Billing Status: 01 - 01 Active, billable
Program Element: 2502 - 2502 HAZ MAT STOR 1-5 CHEM. LG VOL/HG RISK
Contact Name: Sheila Caballero
Record ID: PR0015341
Prior Inspection Dt: 2/19/2014
Current Inspection Dt: 2/19/2017
Designated Emplo: Melissa Palomino

Account ID: AR0013848
Permit No:
Units: 0
Phone: 8006382822
Billing Status: 01 - 01 Active, billable
Program Element: 2301 - 2301 SMALL QTY. GENERATOR UP TO 2,199 LBS/MO.
Contact Name:
Record ID: PR0018912
Prior Inspection Dt:
Current Inspection Dt:
Designated Emplo: Melissa Palomino

---

4 | ***2 of 2*** | ***ESE*** | ***0.12 / 615.27*** | ***1,364.04 / 140*** | ***CALIFORNIA STATE PARKS PACHECO SP***
38787 DINOSAUR POINT RD
HOLLISTER CA 95023-9525 | ***RCRA NON GEN***

EPA Handler ID: CAL000361493
Gen Status Universe: No Report
Contact Name: MICHAEL STEPHENS
Contact Address: 704 O STREET, , SACRAMENTO, CA, 95814,
Contact Phone No and Ext: 916-324-0412
Contact Email: MICHAEL.STEPHENS@PARKS.CA.GOV
Contact Country:
County Name: SAN BENITO
EPA Region: 09
Land Type:
Receive Date: 20110304

Violation/Evaluation Summary

Note: NO RECORDS: As of Oct 2020, there are no Compliance Monitoring and Enforcement (violation) records associated with this facility (EPA ID).

Handler Summary

Importer Activity: No
Mixed Waste Generator: No
Transporter Activity: No
Transfer Facility: No
Onsite Burner Exemption: No

Furnace Exemption:	No
Underground Injection Activity:	No
Commercial TSD:	No
Used Oil Transporter:	No
Used Oil Transfer Facility:	No
Used Oil Processor:	No
Used Oil Refiner:	No
Used Oil Burner:	No
Used Oil Market Burner:	No
Used Oil Spec Marketer:	No

Hazardous Waste Handler Details

Sequence No:	1
Receive Date:	20110304
Handler Name:	CALIFORNIA STATE PARKS PACHECO SP
Source Type:	Implementer
Federal Waste Generator Code:	N
Generator Code Description:	Not a Generator, Verified

Owner/Operator Details

Owner/Operator Ind:	Current Operator	***Street No:***	
Type:	Other	***Street 1:***	704 O STREET
Name:	MICHAEL STEPHENS	***Street 2:***	
Date Became Current:		***City:***	SACRAMENTO
Date Ended Current:		***State:***	CA
Phone:	916-324-0412	***Country:***	
Source Type:	Implementer	***Zip Code:***	95814

Owner/Operator Ind:	Current Owner	***Street No:***	
Type:	Other	***Street 1:***	704 O STREET
Name:	CALIF DEPT OF PARKS & RECREATION	***Street 2:***	1 CAPITOL MALL STE 410
Date Became Current:		***City:***	SACRAMENTO
Date Ended Current:		***State:***	CA
Phone:	916-324-0412	***Country:***	
Source Type:	Implementer	***Zip Code:***	95814-0000

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
5	1 of 1	ESE	0.16 / 819.94	1,381.11 / 157	PACHECO STATE PARK 38778 DINOSAUR POINT GILROY CA 95020	LUST

Global ID:	T0608531207	***County:***	SANTA CLARA
Status:	COMPLETED - CASE CLOSED	***Latitude:***	37.0650444152137
Status Date:	1/31/2006	***Longitude:***	-121.220543653618
Case Type:	LUST CLEANUP SITE		
Date Source:	LUST Cleanup Sites from GeoTracker Search; LUST Cleanup Sites from GeoTracker Cleanup Sites Data Download		

LUST Cleanup Sites from GeoTracker Cleanup Sites Data Download - Facilities Detail(as Nov 16 2020)

RB Case No:	3395	***Potential COC:***	Gasoline
Local Case No:	10S4E36Q01f	***How Discovered:***	
Begin Date:	4/1/1998	***Stop Method:***	
Lead Agency:	SANTA CLARA COUNTY LOP	***Stop Description:***	
Local Agency:		***Case Worker:***	
CUF Case:	NO	***File Location:***	All Files are on GeoTracker or in the Local Agency Database
Potential Media of Concern:	Soil		
How Discovered Description:			
Calwater Watershed Name:	Pajaro River - Pacheco-Santa Ana Creek (305.40)		
DWR GW Subbasin Name:			
Disadvantaged Community:			
Site History:			

LUST Cleanup Sites from GeoTracker Cleanup Sites Data Download - Regulatory Activity(as Nov 16 2020)

Action Type: RESPONSE
Date : 1/31/2006
Action: Correspondence

Action Type: ENFORCEMENT
Date : 1/31/2006
Action: Closure/No Further Action Letter

Action Type: RESPONSE
Date : 3/14/2003
Action: Soil and Water Investigation Report

Action Type: RESPONSE
Date : 7/18/2002
Action: Other Report / Document

Action Type: RESPONSE
Date : 2/1/2002
Action: Soil and Water Investigation Workplan

Action Type: ENFORCEMENT
Date : 10/17/2001
Action: Staff Letter - #17797

Action Type: ENFORCEMENT
Date : 5/12/2000
Action: Warning Letter - #17957

Action Type: RESPONSE
Date : 5/22/1999
Action: Soil and Water Investigation Workplan

Action Type: ENFORCEMENT
Date : 4/7/1999
Action: Staff Letter - #17955

Action Type: RESPONSE
Date : 1/21/1999
Action: Other Report / Document

Action Type: RESPONSE
Date : 6/12/1998
Action: Other Report / Document

Action Type: RESPONSE
Date : 5/4/1998
Action: Unauthorized Release Form

Action Type: RESPONSE
Date : 4/27/1998
Action: Tank Removal Report / UST Sampling Report

Action Type: RESPONSE
Date : 4/1/1998
Action: Other Report / Document

Action Type: Other
Date : 4/1/1998
Action: Leak Reported

Action Type: RESPONSE
Date : 3/2/1998
Action: Correspondence

Action Type: RESPONSE

Date : 1/8/1998
Action: Tank Removal Report / UST Sampling Report

Action Type: RESPONSE
Date : 12/30/1992
Action: Other Report / Document

LUST Cleanup Sites from GeoTracker Cleanup Sites Data Download - Status History(as Nov 16 2020)

Status: Completed - Case Closed
Status Date: 1/31/2006

Status: Open - Case Begin Date
Status Date: 4/1/1998

LUST Sites from GeoTracker Search - Regulatory Profile (as of Oct 06, 2020)

Site Facility Name: PACHECO STATE PARK
Site Facility Type: LUST CLEANUP SITE
Cleanup Status: COMPLETED - CASE CLOSED
Project Status:
WDR Place Type:
WDR File:
WDR Order:
CUF Priority Assig:
CUF Amount Paid:
Potential COC: GASOLINE
Facility Type:
Composting Method:
Address: 38778 DINOSAUR POINT
City: GILROY
Zip: 95020
County: SANTA CLARA
CUF Claim:
File Location: ALL FILES ARE ON GEOTRACKER OR IN THE LOCAL AGENCY DATABASE
Designated Beneficial Use: MUN, AGR, IND, PROC
Project Oversight Agencies:
Report Link: https://geotracker.waterboards.ca.gov/profile_report?global_id=T0608531207
Cleanup Status Detail: COMPLETED - CASE CLOSED AS OF 1/31/2006
Cleanup History Link: https://geotracker.waterboards.ca.gov/profile_report_include?global_id=T0608531207&tabname=regulatoryhistory
Potential Media of Concern: SOIL
User Defined Beneficial Use:
DWR GW Sub Basin:
Calwater Watershed Name: Pajaro River - Pacheco-Santa Ana Creek (305.40)
Post Closure Site Management:
Future Land Use:
Cleanup Oversight Agencies: SANTA CLARA COUNTY LOP (LEAD) - CASE #: 10S4E36Q01f
CENTRAL COAST RWQCB (REGION 3) - CASE #: 3395
Gndwater Monitoring Freque:
Designated Beneficial Use Desc: Municipal and Domestic Supply, Agricultural Supply, Industrial Service Supply, Industrial Process Supply
Site History:

No site history available

LUST Sites from GeoTracker Search - Cleanup Status History (as of Oct 06, 2020)

Status: Completed - Case Closed
Date : 1/31/2006

Status: Open - Case Begin Date
Date : 4/1/1998

LUST Sites from GeoTracker Search - Regulatory Activities (as of Oct 06, 2020)

Action Type: Response Requested - Other
Action Date: 1/31/2006
Received Issue Date: 1/31/2006
Action: Correspondence
Doc Link:
Title Description Comments:

Closure Letter

Action Type: Other Regulatory Actions
Action Date: 1/31/2006
Received Issue Date: 1/31/2006
Action: Closure/No Further Action Letter
Doc Link: http://geotracker.waterboards.ca.gov/view_documents?global_id=T0608531207&enforcement_id=5942484&temptable=ENFORCEMENT
Title Description Comments:

Action Type: Response Requested - Reports
Action Date: 3/14/2003
Received Issue Date: 3/14/2003
Action: Soil and Water Investigation Report
Doc Link: https://geotracker.waterboards.ca.gov/view_documents_all?global_id=T0608531207&doc_id=5828755
Title Description Comments:

SOIL & WATER INVESTIGATION REPORT

Action Type: Response Requested - Other
Action Date: 7/18/2002
Received Issue Date: 7/18/2002
Action: Other Report / Document
Doc Link: https://geotracker.waterboards.ca.gov/view_documents_all?global_id=T0608531207&doc_id=5828766
Title Description Comments:

WORK PLAN

Action Type: Response Requested - Workplans
Action Date: 2/1/2002
Received Issue Date: 7/23/2002
Action: Soil and Water Investigation Workplan
Doc Link:
Title Description Comments:

Soil and Water Investigation Workplan

Action Type: Other Regulatory Actions
Action Date: 10/17/2001
Received Issue Date: 10/17/2001
Action: Staff Letter - #17797
Doc Link:
Title Description Comments:

Action Type: Enforcement/Orders
Action Date: 5/12/2000
Received Issue Date: 5/12/2000
Action: Warning Letter - #17957
Doc Link:
Title Description Comments:

Action Type: Response Requested - Workplans
Action Date: 5/22/1999
Received Issue Date: 7/23/2002
Action: Soil and Water Investigation Workplan
Doc Link:
Title Description Comments:

Soil and Water Investigation Workplan

Action Type: Other Regulatory Actions
Action Date: 4/7/1999
Received Issue Date: 4/7/1999

Action: Staff Letter - #17955
Doc Link:
Title Description Comments:

Action Type: Response Requested - Other
Action Date: 1/21/1999
Received Issue Date: 1/21/1999
Action: Other Report / Document
Doc Link: https://geotracker.waterboards.ca.gov/view_documents_all?global_id=T0608531207&doc_id=5828749
Title Description Comments:

STATE INFO

Action Type: Response Requested - Other
Action Date: 6/12/1998
Received Issue Date: 6/12/1998
Action: Other Report / Document
Doc Link: https://geotracker.waterboards.ca.gov/view_documents_all?global_id=T0608531207&doc_id=5828742
Title Description Comments:

PHONE LOG

Action Type: Response Requested - Other
Action Date: 5/4/1998
Received Issue Date: 5/4/1998
Action: Unauthorized Release Form
Doc Link: https://geotracker.waterboards.ca.gov/view_documents_all?global_id=T0608531207&doc_id=5828764
Title Description Comments:

UNAUTHORIZED RELEASE FORM

Action Type: Response Requested - Reports
Action Date: 4/27/1998
Received Issue Date: 4/27/1998
Action: Tank Removal Report / UST Sampling Report
Doc Link: https://geotracker.waterboards.ca.gov/view_documents_all?global_id=T0608531207&doc_id=5828761
Title Description Comments:

TANK REMOVAL REPORT

Action Type: Response Requested - Other
Action Date: 4/1/1998
Received Issue Date: 4/1/1998
Action: Other Report / Document
Doc Link: https://geotracker.waterboards.ca.gov/view_documents_all?global_id=T0608531207&doc_id=5828745
Title Description Comments:

SITE VISIT

Action Type: Response Requested - Other
Action Date: 3/2/1998
Received Issue Date: 3/2/1998
Action: Correspondence
Doc Link: https://geotracker.waterboards.ca.gov/view_documents_all?global_id=T0608531207&doc_id=5828739
Title Description Comments:

Correspondence

Action Type: Response Requested - Reports
Action Date: 1/8/1998
Received Issue Date: 1/8/1998
Action: Tank Removal Report / UST Sampling Report
Doc Link: https://geotracker.waterboards.ca.gov/view_documents_all?global_id=T0608531207&doc_id=5828758

Title Description Comments:

TANK REMOVAL REPORT

Action Type: Response Requested - Other
Action Date: 12/30/1992
Received Issue Date: 12/30/1992
Action: Other Report / Document
Doc Link: https://geotracker.waterboards.ca.gov/view_documents_all?global_id=T0608531207&doc_id=5828740
Title Description Comments:

MAPS & METROSCAN INFORMATION

Action Type: Leak Action
Action Date: 4/1/1998
Received Issue Date:
Action: Leak Reported
Doc Link:
Title Description Comments:

LUST Sites from GeoTracker Search - Documents (as of Oct 06, 2020)

Document Type: Site Documents ***Size :***
Document Date: 1/31/2006 ***Submitted By:*** JOANNA KINCAID (REGULATOR)
Type: CLOSURE/NO FURTHER ACTION LETTER ***Submitted:***
Title: UNKNOWN
Title Link: https://geotracker.waterboards.ca.gov/view_documents?global_id=T0608531207&enforcement_id=5942484

Document Type: Site Documents ***Size :***
Document Date: 3/14/2003 ***Submitted By:*** JOANNA KINCAID (REGULATOR)
Type: SOIL AND WATER INVESTIGATION REPORT ***Submitted:***
Title: SOIL & WATER INVESTIGATION REPORT - REGULATOR RESPONSE
Title Link: https://geotracker.waterboards.ca.gov/view_documents?global_id=T0608531207&document_id=5828755

Document Type: Site Documents ***Size :***
Document Date: 7/18/2002 ***Submitted By:*** JOANNA KINCAID (REGULATOR)
Type: OTHER REPORT / DOCUMENT ***Submitted:***
Title: WORK PLAN - REGULATOR RESPONSE
Title Link: https://geotracker.waterboards.ca.gov/view_documents?global_id=T0608531207&document_id=5828766

Document Type: Site Documents ***Size :***
Document Date: 1/21/1999 ***Submitted By:*** JOANNA KINCAID (REGULATOR)
Type: OTHER REPORT / DOCUMENT ***Submitted:***
Title: STATE INFO - REGULATOR RESPONSE
Title Link: https://geotracker.waterboards.ca.gov/view_documents?global_id=T0608531207&document_id=5828749

Document Type: Site Documents ***Size :***
Document Date: 6/12/1998 ***Submitted By:*** JOANNA KINCAID (REGULATOR)
Type: OTHER REPORT / DOCUMENT ***Submitted:***
Title: PHONE LOG - REGULATOR RESPONSE
Title Link: https://geotracker.waterboards.ca.gov/view_documents?global_id=T0608531207&document_id=5828742

Document Type: Site Documents ***Size :***
Document Date: 5/4/1998 ***Submitted By:*** JOANNA KINCAID (REGULATOR)
Type: UNAUTHORIZED RELEASE FORM ***Submitted:***
Title: UNAUTHORIZED RELEASE FORM - REGULATOR RESPONSE
Title Link: https://geotracker.waterboards.ca.gov/view_documents?global_id=T0608531207&document_id=5828764

Document Type: Site Documents ***Size :***
Document Date: 4/27/1998 ***Submitted By:*** JOANNA KINCAID (REGULATOR)
Type: TANK REMOVAL REPORT / UST SAMPLING REPORT ***Submitted:***
Title: TANK REMOVAL REPORT - REGULATOR RESPONSE
Title Link: https://geotracker.waterboards.ca.gov/view_documents?global_id=T0608531207&document_id=5828761

Document Type: Site Documents
Size :
Document Date: 4/1/1998
Submitted By: JOANNA KINCAID (REGULATOR)
Type: OTHER REPORT / DOCUMENT
Submitted:
Title: SITE VISIT - REGULATOR RESPONSE
Title Link: https://geotracker.waterboards.ca.gov/view_documents?global_id=T0608531207&document_id=5828745

Document Type: Site Documents
Size :
Document Date: 3/2/1998
Submitted By: JOANNA KINCAID (REGULATOR)
Type: CORRESPONDENCE
Submitted:
Title: CORRESPONDENCE - REGULATOR RESPONSE
Title Link: https://geotracker.waterboards.ca.gov/view_documents?global_id=T0608531207&document_id=5828739

Document Type: Site Documents
Size :
Document Date: 1/8/1998
Submitted By: JOANNA KINCAID (REGULATOR)
Type: TANK REMOVAL REPORT / UST SAMPLING REPORT
Submitted:
Title: TANK REMOVAL REPORT - REGULATOR RESPONSE
Title Link: https://geotracker.waterboards.ca.gov/view_documents?global_id=T0608531207&document_id=5828758

Document Type: Site Documents
Size :
Document Date: 12/30/1992
Submitted By: JOANNA KINCAID (REGULATOR)
Type: OTHER REPORT / DOCUMENT
Submitted:
Title: MAPS & METROSCAN INFORMATION - REGULATOR RESPONSE
Title Link: https://geotracker.waterboards.ca.gov/view_documents?global_id=T0608531207&document_id=5828740

Unplottable Summary

Total: 5 Unplottable sites

DB	Company Name/Site Name	Address	City	Zip	ERIS ID
DELISTED COUNTY	AT&T Mobility - International Turbine Research (USID79713)	Pacheco Pass HWY	Santa Nella CA		820099373
GEOTRACKER	B&T FARMS - BP CHRISTOPHER (AW1524)	PACHECO PASS HWY.	GILROY CA		875383826
HMIRS		HWY 152	GILROY CA		818419673
MERCED CUPA	SCVWD - PACHECO PUMP STATION	Dinosaur Point Road	Merced County, CA 95322 CA		820099340
RCRA NON GEN	AT&T MOBILITY	PACHECO PASS HWY PACHECO STATE PARK ***EPA Handler ID:*** CAL000423756	SANTA NELLA CA	95322	874009169

Unplottable Report

Site: ***AT&T Mobility - International Turbine Research (USID79713)***
Pacheco Pass HWY Santa Nella CA

DELISTED COUNTY

Original Source Facility ID: FA0007619
Original Source Name: Merced County CUPA Facilities List
Record Date: 15-SEP-2017

Site: ***B&T FARMS - BP CHRISTOPHER (AW1524)***
PACHECO PASS HWY. GILROY CA

GEOTRACKER

Global ID: AGL020020222
Status: TERMINATED
Status Date:
Site Facility Type: IRRIGATED LANDS REGULATORY PROGRAM
Latitude:
Longitude:
County: SANTA CLARA

Site:
HWY 152 GILROY CA

HMIRS

Incident County: SANTA CLARA

HMIR Incident Reports

Report No:	I-1997070967	***Fed DOT Agency Nm:***	
Report Type:	A hazardous material incident	***Fed DOT Report No:***	
Date of Incident:	1997-07-07	***Report Submit Src:***	Paper
Time of Incident:	1200	***Inc Multiple Rows:***	Yes
Haz Class Code:		***Inc Non US State:***	
Hazardous Class:	9	***Mode Transport:***	Highway
Commodity Short Nm:	HAZARDOUS WASTE, SOLID,	***Transport Phase:***	In Transit
Commodity Long Nm:	HAZARDOUS WASTE, SOLID, N.O.S.	***Incident Occrrnce:***	
Trade Name:	SOIL & DEBRIS TPH	***Mat Ship Approval?:***	No
ID No:	NA3077	***Mat Ship Approv No:***	
Haz Waste Ind:	Yes	***Undecl Hazmat Ship?:***	No
Haz Waste EPA No:		***Packaging Type:***	Non-Bulk
HMIS Tox Inhalation?:	No	***Packing Group:***	
TIH Hazard Zone:		***Carrier Reporter:***	ALLWASTE TRANSPORTATION
Qty Released:	8	***CR Street Name:***	12475 LLAGAS AVE
Unit of Measure:	Solid - Pound	***CR City:***	SAN MARTIN
What Failed:	103	***CR State:***	CA
What Failed Desc:	Basic Material	***CR Postal Code:***	95046
How Failed Code:	303	***CR Non US State:***	
How Failed Desc:	Burst or Ruptured	***CR Fed DOT ID:***	216281
Failure Cause Code:		***CR Hazmat Reg ID:***	
Failure Cause Desc:		***CR Country:***	US
Ident. Markings:		***Shipper Name:***	FAST FABRICATORS
Cont1 Pkging Type:		***Shipper Street Name:***	3387 PLUMAS ARBOGA RD
Cont1 Const Mat:		***Shipper City:***	MARYSVILLE
Cont1 Head Type:		***Shipper State:***	CA
Cont1 Pkg Capacity:	700	***Shipper Postal:***	
C1 Capacity UOM:	SLB	***Shipper Non US St:***	
Cont1 Pkg Amt:	0	***Shipper Country:***	US
C1 Pkg Amt UOM:		***Shipper Waybill:***	96852579
Cont1 Pkg No:	8	***Ship Hazmat Reg ID:***	
C1 Pkg NO Failed:	1	***Origin City:***	
Cont1 Pkg Mnfctr:	NOT REPORTED BY CARRIER	***Origin State:***	
Cont1 Pkg Mnfct Dt:	0-00-00 00:00:00	***Origin Postal:***	
Cont1 Pkg Serial NO:		***Origin Non US St:***	
C1 Pkg Last Test Dt:	1987-01-01 00:00:00	***Origin Country:***	US

C1 Test Const Mat:		***Destination City:***	KETTLEMAN CITY
C1 Pkg Dsign Pres.:	0	***Destination State:***	CALIFORNIA
C1 Dsign Press UOM:		***Destination Postal:***	93239
C1 Pkg Shell Thick:	0	***Destination Non US:***	
C1 Shell Thick UOM:		***Destination Country:***	US
C1 Head Thickness:	0	***Cont2 Package Type:***	
C1 Head Thick UOM:		***Cont2 Const Mat:***	
C1 Pkg Srvc Pres.:	0	***Cont2 Pkg Capacity:***	0
C1 Srvc Press UOM:		***Cont2 Capacity UOM:***	
C1 Valve/Device Fail?:	No	***Cont2 Pkg Amount:***	0
C1 Device Type:		***Cont2 Pkg Amt UOM:***	
C1 Device Mnfctr:		***Cont2 Pkg No:***	0
C1 Device Model:		***Cont2 Pkg No Failed:***	0
NRC No:	394139		

RAM Pkg Category:		***Haz NonHosp Public:***	0
RAM Pkg Cert.:	FALSE	***Haz NonHosp Old:***	
RAM Pkg Cert. NBR:		***Tot Haz Non Hosp Inj:***	
RAM Nuclide S:		***Total Hazmat Injuries:***	0
RAM Transport Index:		***Evacuation Indicator:***	No
RAM UOM:		***Public Evacuated:***	0
RAM Activity Rpted:	0	***Employees Evac:***	0
RAM UOM Rpted:		***Total Evacuated:***	0
RAM Activity:	0	***Total Evacuation Hrs:***	0
RAM Activity UOM:		***Major Artery Closed:***	No
RAM Mat Safety:		***Mjr Artery Hrs Closed:***	0
Spillage Result:	Yes	***Material Involved:***	No
Fire Result:	No	***Estimated Speed:***	0
Explosion Result:	No	***Weather Conditions:***	
Water Sewer Result:	No	***Vehicle Overturn:***	No
Gas Dispersion:	No	***Vehicle Left Roadway:***	No
Environment Damage:	No	***Passenger Aircraft:***	No
No Release Result:	No	***Cargo Baggage:***	
Fire EMS Report:	No	***Ship Non Transport:***	No
Fire EMS EMS Report:		***Ship Air First Flight:***	No
Police Report:	No	***Ship Air Subflight:***	No
Police Report No:		***Ship Init Transport:***	No
In House Cleanup:	No	***Ship Phase Transfer:***	No
Other Cleanup:	No	***Contact Name:***	JAMI DAVIS
Damage > 500:	Yes	***Contact Title:***	COMPLIANCE MANAGER
Material Loss:	0	***Contact Business:***	
Carrier Damage:	0	***Contact Street:***	
Property Damage:	0	***Contact City:***	
Response Cost:	0	***Contact State:***	
Remediation Cost:	1000	***Contact Postal:***	
Damage Old Form:	300	***Contact Non US St:***	
Total Damages Amt:	1300	***Contact Country:***	US
Hazmat Fatality:	No	***Inc. Report Prepared:***	
Haz Fatal Employees:	0	***HMIS Serious Incidnt:***	No
Haz Fatal Respndrs:	0	***HMIS Serious Fatality:***	No
Haz Fatal Gen Public:	0	***HMIS Serious Injury:***	No
Tot Hazmat Fatalities:	0	***HMIS Flight Plan:***	No
Non Hazmat Fatality:	No	***HMIS Serious Evacs:***	No
Non Hazmat Fatals:	0	***HMIS Major Artery:***	No
Hazmat Injury:	No	***HMIS Bulk Release:***	No
Haz Hospital Empl:	0	***HMIS Marine Pollutnt:***	No
Haz Hospital Resp:	0	***HMIS Radioactive:***	No
Haz Hosp Gen Public:	0	***HMIS Gen Pkg Type:***	DRUM METAL
Haz Hosp Old Form:	0	***HMIS Container Code:***	1A2
Total Haz Hosp Inj:	0	***HMIS Container Desc:***	Removable head steel drum
Haz Non Hosp Empl:	0	***HMIS Bulk Incident:***	No
Haz Non Hosp Resp:	0	***Undeclared Shipment:***	No
Description of Events:			
Recommend Actions Taken:			

HMIR Incident Reports

Report No:	I-1997070967	***Fed DOT Agency Nm:***	
Report Type:	A hazardous material incident	***Fed DOT Report No:***	
Date of Incident:	1997-07-07	***Report Submit Src:***	Paper

Time of Incident:	1200	***Inc Multiple Rows:***	Yes
Haz Class Code:		***Inc Non US State:***	
Hazardous Class:	9	***Mode Transport:***	Highway
Commodity Short Nm:	HAZARDOUS WASTE, LIQUID,	***Transport Phase:***	In Transit
Commodity Long Nm:	HAZARDOUS WASTE, LIQUID, N.O.S.	***Incident Occrrnce:***	
Trade Name:	POLYCHLORINATED BIPH	***Mat Ship Approval?:***	No
ID No:	NA3082	***Mat Ship Approv No:***	
Haz Waste Ind:	Yes	***Undecl Hazmat Ship?:***	No
Haz Waste EPA No:		***Packaging Type:***	Non-Bulk
HMIS Tox Inhalation?:	No	***Packing Group:***	
TIH Hazard Zone:		***Carrier Reporter:***	ALLWASTE TRANSPORTATION
Qty Released:	5	***CR Street Name:***	12475 LLAGAS AVE
Unit of Measure:	Liquid - Gallon	***CR City:***	SAN MARTIN
What Failed:	103	***CR State:***	CA
What Failed Desc:	Basic Material	***CR Postal Code:***	95046
How Failed Code:	303	***CR Non US State:***	
How Failed Desc:	Burst or Ruptured	***CR Fed DOT ID:***	216281
Failure Cause Code:		***CR Hazmat Reg ID:***	
Failure Cause Desc:		***CR Country:***	US
Ident. Markings:		***Shipper Name:***	PACIFIC GAS & ELECTRIC CO
Cont1 Pkging Type:		***Shipper Street Name:***	10900 N. BLANEY AVE
Cont1 Const Mat:		***Shipper City:***	CUPERTINO
Cont1 Head Type:		***Shipper State:***	CA
Cont1 Pkg Capacity:	48.610001	***Shipper Postal:***	95014
C1 Capacity UOM:	LGA	***Shipper Non US St:***	
Cont1 Pkg Amt:	0	***Shipper Country:***	US
C1 Pkg Amt UOM:		***Shipper Waybill:***	96614867
Cont1 Pkg No:	10	***Ship Hazmat Reg ID:***	
C1 Pkg NO Failed:	1	***Origin City:***	
Cont1 Pkg Mnfctr:	NOT REPORTED BY CARRIER	***Origin State:***	
Cont1 Pkg Mnfct Dt:	0-00-00 00:00:00	***Origin Postal:***	
Cont1 Pkg Serial NO:		***Origin Non US St:***	
C1 Pkg Last Test Dt:	1996-01-01 00:00:00	***Origin Country:***	US
C1 Test Const Mat:		***Destination City:***	KETTLEMAN CITY
C1 Pkg Dsign Pres.:	0	***Destination State:***	CALIFORNIA
C1 Dsign Press UOM:		***Destination Postal:***	93239
C1 Pkg Shell Thick:	0	***Destination Non US:***	
C1 Shell Thick UOM:		***Destination Country:***	US
C1 Head Thickness:	0	***Cont2 Package Type:***	
C1 Head Thick UOM:		***Cont2 Const Mat:***	
C1 Pkg Srvc Pres.:	0	***Cont2 Pkg Capacity:***	0
C1 Srvc Press UOM:		***Cont2 Capacity UOM:***	
C1 Valve/Device Fail?:	No	***Cont2 Pkg Amount:***	0
C1 Device Type:		***Cont2 Pkg Amt UOM:***	
C1 Device Mnfctr:		***Cont2 Pkg No:***	0
C1 Device Model:		***Cont2 Pkg No Failed:***	0
NRC No:	394139		

RAM Pkg Category:		***Haz NonHosp Public:***	0
RAM Pkg Cert.:	FALSE	***Haz NonHosp Old:***	
RAM Pkg Cert. NBR:		***Tot Haz Non Hosp Inj:***	
RAM Nuclide S:		***Total Hazmat Injuries:***	0
RAM Transport Index:		***Evacuation Indicator:***	No
RAM UOM:		***Public Evacuated:***	0
RAM Activity Rpted:	0	***Employees Evac:***	0
RAM UOM Rpted:		***Total Evacuated:***	0
RAM Activity:	0	***Total Evacuation Hrs:***	0
RAM Activity UOM:		***Major Artery Closed:***	No
RAM Mat Safety:		***Mjr Artery Hrs Closed:***	0
Spillage Result:	Yes	***Material Involved:***	No
Fire Result:	No	***Estimated Speed:***	0
Explosion Result:	No	***Weather Conditions:***	
Water Sewer Result:	No	***Vehicle Overturn:***	No
Gas Dispersion:	No	***Vehicle Left Roadway:***	No
Environment Damage:	No	***Passenger Aircraft:***	No
No Release Result:	No	***Cargo Baggage:***	
Fire EMS Report:	No	***Ship Non Transport:***	No
Fire EMS EMS Report:		***Ship Air First Flight:***	No
Police Report:	No	***Ship Air Subflight:***	No
Police Report No:		***Ship Init Transport:***	No
In House Cleanup:	No	***Ship Phase Transfer:***	No

Other Cleanup:	No	***Contact Name:***	JAMI DAVIS
Damage > 500:	Yes	***Contact Title:***	COMPLIANCE MANAGER
Material Loss:	0	***Contact Business:***	
Carrier Damage:	0	***Contact Street:***	
Property Damage:	0	***Contact City:***	
Response Cost:	0	***Contact State:***	
Remediation Cost:	1000	***Contact Postal:***	
Damage Old Form:	300	***Contact Non US St:***	
Total Damages Amt:	1300	***Contact Country:***	US
Hazmat Fatality:	No	***Inc. Report Prepared:***	
Haz Fatal Employees:	0	***HMIS Serious Incidnt:***	No
Haz Fatal Respndrs:	0	***HMIS Serious Fatality:***	No
Haz Fatal Gen Public:	0	***HMIS Serious Injury:***	No
Tot Hazmat Fatalities:	0	***HMIS Flight Plan:***	No
Non Hazmat Fatality:	No	***HMIS Serious Evacs:***	No
Non Hazmat Fatals:	0	***HMIS Major Artery:***	No
Hazmat Injury:	No	***HMIS Bulk Release:***	No
Haz Hospital Empl:	0	***HMIS Marine Pollutnt:***	No
Haz Hospital Resp:	0	***HMIS Radioactive:***	No
Haz Hosp Gen Public:	0	***HMIS Gen Pkg Type:***	DRUM METAL
Haz Hosp Old Form:	0	***HMIS Container Code:***	1A1
Total Haz Hosp Inj:	0	***HMIS Container Desc:***	Non-removable head steel drum
Haz Non Hosp Empl:	0	***HMIS Bulk Incident:***	No
Haz Non Hosp Resp:	0	***Undeclared Shipment:***	No
Description of Events:			
Recommend Actions Taken:			

HMIR Incident Reports

Report No:	I-1997070967	***Fed DOT Agency Nm:***	
Report Type:	A hazardous material incident	***Fed DOT Report No:***	
Date of Incident:	1997-07-07	***Report Submit Src:***	Paper
Time of Incident:	1200	***Inc Multiple Rows:***	Yes
Haz Class Code:		***Inc Non US State:***	
Hazardous Class:	9	***Mode Transport:***	Highway
Commodity Short Nm:	HAZARDOUS WASTE, SOLID,	***Transport Phase:***	In Transit
Commodity Long Nm:	HAZARDOUS WASTE, SOLID, N.O.S.	***Incident Occrrnce:***	
Trade Name:	SOLID	***Mat Ship Approval?:***	No
ID No:	NA3077	***Mat Ship Approv No:***	
Haz Waste Ind:	Yes	***Undecl Hazmat Ship?:***	No
Haz Waste EPA No:		***Packaging Type:***	Non-Bulk
HMIS Tox Inhalation?:	No	***Packing Group:***	
TIH Hazard Zone:		***Carrier Reporter:***	ALLWASTE TRANSPORTATION
Qty Released:	8	***CR Street Name:***	12475 LLAGAS AVE
Unit of Measure:	Solid - Pound	***CR City:***	SAN MARTIN
What Failed:	103	***CR State:***	CA
What Failed Desc:	Basic Material	***CR Postal Code:***	95046
How Failed Code:	303	***CR Non US State:***	
How Failed Desc:	Burst or Ruptured	***CR Fed DOT ID:***	216281
Failure Cause Code:		***CR Hazmat Reg ID:***	
Failure Cause Desc:		***CR Country:***	US
Ident. Markings:		***Shipper Name:***	TAN THAP INC
Cont1 Pkging Type:		***Shipper Street Name:***	3445 KIFER RD
Cont1 Const Mat:		***Shipper City:***	SANTA CLARA
Cont1 Head Type:		***Shipper State:***	CA
Cont1 Pkg Capacity:	360	***Shipper Postal:***	950510711
C1 Capacity UOM:	SLB	***Shipper Non US St:***	
Cont1 Pkg Amt:	0	***Shipper Country:***	US
C1 Pkg Amt UOM:		***Shipper Waybill:***	90733932
Cont1 Pkg No:	24	***Ship Hazmat Reg ID:***	
C1 Pkg NO Failed:	1	***Origin City:***	
Cont1 Pkg Mnfctr:	NOT REPORTED BY CARRIER	***Origin State:***	
Cont1 Pkg Mnfct Dt:	0-00-00 00:00:00	***Origin Postal:***	
Cont1 Pkg Serial NO:		***Origin Non US St:***	
C1 Pkg Last Test Dt:	1997-01-01 00:00:00	***Origin Country:***	US
C1 Test Const Mat:		***Destination City:***	KETTLEMAN CITY
C1 Pkg Dsign Pres.:	0	***Destination State:***	CALIFORNIA
C1 Dsign Press UOM:		***Destination Postal:***	93239
C1 Pkg Shell Thick:	0	***Destination Non US:***	
C1 Shell Thick UOM:		***Destination Country:***	US

C1 Head Thickness:	0	***Cont2 Package Type:***	
C1 Head Thick UOM:		***Cont2 Const Mat:***	
C1 Pkg Srvc Pres.:	0	***Cont2 Pkg Capacity:***	0
C1 Srvc Press UOM:		***Cont2 Capacity UOM:***	
C1 Valve/Device Fail?:	No	***Cont2 Pkg Amount:***	0
C1 Device Type:		***Cont2 Pkg Amt UOM:***	
C1 Device Mnfctr:		***Cont2 Pkg No:***	0
C1 Device Model:		***Cont2 Pkg No Failed:***	0
NRC No:	394139		

RAM Pkg Category:		***Haz NonHosp Public:***	0
RAM Pkg Cert.:	FALSE	***Haz NonHosp Old:***	
RAM Pkg Cert. NBR:		***Tot Haz Non Hosp Inj:***	
RAM Nuclide S:		***Total Hazmat Injuries:***	0
RAM Transport Index:		***Evacuation Indicator:***	No
RAM UOM:		***Public Evacuated:***	0
RAM Activity Rpted:	0	***Employees Evac:***	0
RAM UOM Rpted:		***Total Evacuated:***	0
RAM Activity:	0	***Total Evacuation Hrs:***	0
RAM Activity UOM:		***Major Artery Closed:***	No
RAM Mat Safety:		***Mjr Artery Hrs Closed:***	0
Spillage Result:	Yes	***Material Involved:***	No
Fire Result:	No	***Estimated Speed:***	0
Explosion Result:	No	***Weather Conditions:***	
Water Sewer Result:	No	***Vehicle Overturn:***	No
Gas Dispersion:	No	***Vehicle Left Roadway:***	No
Environment Damage:	No	***Passenger Aircraft:***	No
No Release Result:	No	***Cargo Baggage:***	
Fire EMS Report:	No	***Ship Non Transport:***	No
Fire EMS EMS Report:		***Ship Air First Flight:***	No
Police Report:	No	***Ship Air Subflight:***	No
Police Report No:		***Ship Init Transport:***	No
In House Cleanup:	No	***Ship Phase Transfer:***	No
Other Cleanup:	No	***Contact Name:***	JAMI DAVIS
Damage > 500:	Yes	***Contact Title:***	COMPLIANCE MANAGER
Material Loss:	0	***Contact Business:***	
Carrier Damage:	0	***Contact Street:***	
Property Damage:	0	***Contact City:***	
Response Cost:	0	***Contact State:***	
Remediation Cost:	1000	***Contact Postal:***	
Damage Old Form:	300	***Contact Non US St:***	
Total Damages Amt:	1300	***Contact Country:***	US
Hazmat Fatality:	No	***Inc. Report Prepared:***	
Haz Fatal Employees:	0	***HMIS Serious Incidnt:***	No
Haz Fatal Respndrs:	0	***HMIS Serious Fatality:***	No
Haz Fatal Gen Public:	0	***HMIS Serious Injury:***	No
Tot Hazmat Fatalities:	0	***HMIS Flight Plan:***	No
Non Hazmat Fatality:	No	***HMIS Serious Evacs:***	No
Non Hazmat Fatals:	0	***HMIS Major Artery:***	No
Hazmat Injury:	No	***HMIS Bulk Release:***	No
Haz Hospital Empl:	0	***HMIS Marine Pollutnt:***	No
Haz Hospital Resp:	0	***HMIS Radioactive:***	No
Haz Hosp Gen Public:	0	***HMIS Gen Pkg Type:***	DRUM METAL
Haz Hosp Old Form:	0	***HMIS Container Code:***	DRUM MTL
Total Haz Hosp Inj:	0	***HMIS Container Desc:***	Metal drum
Haz Non Hosp Empl:	0	***HMIS Bulk Incident:***	No
Haz Non Hosp Resp:	0	***Undeclared Shipment:***	No
Description of Events:			
Recommend Actions Taken:			

Site: ***SCVWD - PACHECO PUMP STATION***
Dinosaur Point Road Merced County, CA 95322 CA

MERCED CUPA

Facility ID:	FA0007936
Latitude:	0
Longitude:	0

Detail(s)

Account ID:	AR0014918	***Record ID:***	PR0016468
Permit No:		***Prior Inspection Dt:***	
Units:	0	***Current Inspection Dt:***	
Phone:	9253371808	***Designated Emplo:***	(none)
Billing Status:	02 - 02 Inactive, non-billable		
Program Element:	2301 - 2301 SMALL QTY. GENERATOR UP TO 2,199 LBS/MO.		
Contact Name:			

Account ID:	AR0014918	***Record ID:***	PR0016470
Permit No:		***Prior Inspection Dt:***	
Units:	0	***Current Inspection Dt:***	
Phone:	9253371808	***Designated Emplo:***	Melissa Palomino
Billing Status:	01 - 01 Active, billable		
Program Element:	2301 - 2301 SMALL QTY. GENERATOR UP TO 2,199 LBS/MO.		
Contact Name:			

Account ID:	AR0014918	***Record ID:***	PR0016471
Permit No:		***Prior Inspection Dt:***	
Units:	0	***Current Inspection Dt:***	
Phone:	9253371808	***Designated Emplo:***	Melissa Palomino
Billing Status:	01 - 01 Active, billable		
Program Element:	2504 - 2504 HAZ MAT STOR 6 OR MORE HG RISK/LG VOL		
Contact Name:			

Account ID:	AR0014918	***Record ID:***	PR0016469
Permit No:		***Prior Inspection Dt:***	
Units:	0	***Current Inspection Dt:***	
Phone:	9253371808	***Designated Emplo:***	(none)
Billing Status:	02 - 02 Inactive, non-billable		
Program Element:	2504 - 2504 HAZ MAT STOR 6 OR MORE HG RISK/LG VOL		
Contact Name:			

Site: ***AT&T MOBILITY***
PACHECO PASS HWY PACHECO STATE PARK SANTA NELLA CA 95322

RCRA NON GEN

EPA Handler ID:	CAL000423756
Gen Status Universe:	No Report
Contact Name:	DERONICA LAMB
Contact Address:	308 S. AKARD ST ROOM 1700, , DALLAS, TX, 75202-0000,
Contact Phone No and Ext:	214-741-0464
Contact Email:	DR1429@ATT.COM
Contact Country:	
County Name:	MERCED
EPA Region:	09
Land Type:	
Receive Date:	20170103

Violation/Evaluation Summary

Note: NO RECORDS: As of Oct 2020, there are no Compliance Monitoring and Enforcement (violation) records associated with this facility (EPA ID).

Handler Summary

Importer Activity:	No
Mixed Waste Generator:	No
Transporter Activity:	No
Transfer Facility:	No
Onsite Burner Exemption:	No
Furnace Exemption:	No
Underground Injection Activity:	No
Commercial TSD:	No
Used Oil Transporter:	No
Used Oil Transfer Facility:	No
Used Oil Processor:	No
Used Oil Refiner:	No
Used Oil Burner:	No
Used Oil Market Burner:	No

Used Oil Spec Marketer: No

Hazardous Waste Handler Details

Sequence No: 1
Receive Date: 20170103
Handler Name: AT&T MOBILITY
Source Type: Implementer
Federal Waste Generator Code: N
Generator Code Description: Not a Generator, Verified

Owner/Operator Details

Owner/Operator Ind: Current Owner
Type: Other
Name: NEW CINGULAR WIRELESS PCS, LLC
Date Became Current:
Date Ended Current:
Phone: 214-741-0464
Source Type: Implementer
Street No:
Street 1: 308 S. AKARD ST. ROOM 1700
Street 2:
City: DALLAS
State: TX
Country:
Zip Code: 75202-0000

Owner/Operator Ind: Current Operator
Type: Other
Name: DERONICA LAMB
Date Became Current:
Date Ended Current:
Phone: 214-741-0464
Source Type: Implementer
Street No:
Street 1: 308 S. AKARD ST ROOM 1700
Street 2:
City: DALLAS
State: TX
Country:
Zip Code: 75202-0000

Appendix: Database Descriptions

Environmental Risk Information Services (ERIS) can search the following databases. The extent of historical information varies with each database and current information is determined by what is publicly available to ERIS at the time of update. ERIS updates databases as set out in ASTM Standard E1527-13, Section 8.1.8 Sources of Standard Source Information:

"Government information from nongovernmental sources may be considered current if the source updates the information at least every 90 days, or, for information that is updated less frequently than quarterly by the government agency, within 90 days of the date the government agency makes the information available to the public."

Standard Environmental Record Sources

Federal

Facility Response Plan: FRP

List of facilities that have submitted Facility Response Plans (FRP) to EPA. Facilities that could reasonably be expected to cause "substantial harm" to the environment by discharging oil into or on navigable waters are required to prepare and submit Facility Response Plans (FRPs). Harm is determined based on total oil storage capacity, secondary containment and age of tanks, oil transfer activities, history of discharges, proximity to a public drinking water intake or sensitive environments.

Government Publication Date: Mar 26, 2020

National Priority List: NPL

National Priorities List (Superfund)-NPL: EPA's (United States Environmental Protection Agency) list of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term remedial action under the Superfund program. The NPL, which EPA is required to update at least once a year, is based primarily on the score a site receives from EPA's Hazard Ranking System. A site must be on the NPL to receive money from the Superfund Trust Fund for remedial action.

Government Publication Date: Dec 30, 2020

National Priority List - Proposed: PROPOSED NPL

Includes sites proposed (by the EPA, the state, or concerned citizens) for addition to the NPL due to contamination by hazardous waste and identified by the Environmental Protection Agency (EPA) as a candidate for cleanup because it poses a risk to human health and/or the environment.

Government Publication Date: Dec 30, 2020

Deleted NPL: DELETED NPL

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Government Publication Date: Dec 30, 2020

SEMS List 8R Active Site Inventory: SEMS

The Superfund Program has deployed the Superfund Enterprise Management System (SEMS), which integrates multiple legacy systems into a comprehensive tracking and reporting tool. This inventory contains active sites evaluated by the Superfund program that are either proposed to be or are on the National Priorities List (NPL) as well as sites that are in the screening and assessment phase for possible inclusion on the NPL. The Active Site Inventory Report displays site and location information at active SEMS sites. An active site is one at which site assessment, removal, remedial, enforcement, cost recovery, or oversight activities are being planned or conducted.

Government Publication Date: Oct 28, 2020

Inventory of Open Dumps, June 1985: ODI

The Resource Conservation and Recovery Act (RCRA) provides for publication of an inventory of open dumps. The Act defines "open dumps" as facilities which do not comply with EPA's "Criteria for Classification of Solid Waste Disposal Facilities and Practices" (40 CFR 257).

Government Publication Date: Jun 1985

SEMS List 8R Archive Sites: SEMS ARCHIVE

The Superfund Enterprise Management System (SEMS) Archived Site Inventory displays site and location information at sites archived from SEMS. An archived site is one at which EPA has determined that assessment has been completed and no further remedial action is planned under the Superfund program at this time.

Government Publication Date: Oct 28, 2020

Comprehensive Environmental Response, Compensation and Liability Information System - CERCLIS: CERCLIS

Superfund is a program administered by the United States Environmental Protection Agency (EPA) to locate, investigate, and clean up the worst hazardous waste sites throughout the United States. CERCLIS is a database of potential and confirmed hazardous waste sites at which the EPA Superfund program has some involvement. It contains sites that are either proposed to be or are on the National Priorities List (NPL) as well as sites that are in the screening and assessment phase for possible inclusion on the NPL. The EPA administers the Superfund program in cooperation with individual states and tribal governments; this database is made available by the EPA.

Government Publication Date: Oct 25, 2013

EPA Report on the Status of Open Dumps on Indian Lands: IODI

Public Law 103-399, The Indian Lands Open Dump Cleanup Act of 1994, enacted October 22, 1994, identified congressional concerns that solid waste open dump sites located on American Indian or Alaska Native (AI/AN) lands threaten the health and safety of residents of those lands and contiguous areas. The purpose of the Act is to identify the location of open dumps on Indian lands, assess the relative health and environment hazards posed by those sites, and provide financial and technical assistance to Indian tribal governments to close such dumps in compliance with Federal standards and regulations or standards promulgated by Indian Tribal governments or Alaska Native entities.

Government Publication Date: Dec 31, 1998

CERCLIS - No Further Remedial Action Planned: CERCLIS NFRAP

An archived site is one at which EPA has determined that assessment has been completed and no further remedial action is planned under the Superfund program at this time. The Archive designation means that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National Priorities List (NPL). This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

Government Publication Date: Oct 25, 2013

CERCLIS Liens: CERCLIS LIENS

A Federal Superfund lien exists at any property where EPA has incurred Superfund costs to address contamination ("Superfund site") and has provided notice of liability to the property owner. A Federal CERCLA ("Superfund") lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. This database is made available by the United States Environmental Protection Agency (EPA).

Government Publication Date: Jan 30, 2014

RCRA CORRACTS-Corrective Action: RCRA CORRACTS

RCRA Info is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. At these sites, the Corrective Action Program ensures that cleanups occur. EPA and state regulators work with facilities and communities to design remedies based on the contamination, geology, and anticipated use unique to each site.

Government Publication Date: Oct 19, 2020

RCRA non-CORRACTS TSD Facilities: RCRA TSD

RCRA Info is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. This database includes Non-Corrective Action sites listed as treatment, storage and/or disposal facilities of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA).

Government Publication Date: Oct 19, 2020

RCRA Generator List: RCRA LQG

RCRA Info is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRA Info replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System (RCRIS) and the Biennial Reporting System (BRS). A hazardous waste generator is any person or site whose processes and actions create hazardous waste (see 40 CFR 260.10). Large Quantity Generators (LQGs) generate 1,000 kilograms per month or more of hazardous waste or more than one kilogram per month of acutely hazardous waste.

Government Publication Date: Oct 19, 2020

RCRA Small Quantity Generators List: RCRA SQG

RCRA Info is the EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRA Info replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System (RCRIS) and the Biennial Reporting System (BRS). A hazardous waste generator is any person or site whose processes and actions create hazardous waste (see 40 CFR 260.10). Small Quantity Generators (SQGs) generate more than 100 kilograms, but less than 1,000 kilograms, of hazardous waste per month.

Government Publication Date: Oct 19, 2020

RCRA Very Small Quantity Generators List: RCRA VSQG

RCRA Info is the EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. A hazardous waste generator is any person or site whose processes and actions create hazardous waste (see 40 CFR 260.10). Very Small Quantity Generators (VSQG) generate 100 kilograms or less per month of hazardous waste, or one kilogram or less per month of acutely hazardous waste. Additionally, VSQG may not accumulate more than 1,000 kilograms of hazardous waste at any time.

Government Publication Date: Oct 19, 2020

RCRA Non-Generators: RCRA NON GEN

RCRA Info is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRA Info replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System (RCRIS) and the Biennial Reporting System (BRS). A hazardous waste generator is any person or site whose processes and actions create hazardous waste (see 40 CFR 260.10). Non-Generators do not presently generate hazardous waste.

Government Publication Date: Oct 19, 2020

Federal Engineering Controls-ECs: FED ENG

Engineering controls (ECs) encompass a variety of engineered and constructed physical barriers (e.g., soil capping, sub-surface venting systems, mitigation barriers, fences) to contain and/or prevent exposure to contamination on a property. This database is made available by the United States Environmental Protection Agency (EPA).

Government Publication Date: Aug 26, 2020

Federal Institutional Controls- ICs: FED INST

Institutional controls are non-engineered instruments, such as administrative and legal controls, that help minimize the potential for human exposure to contamination and/or protect the integrity of the remedy. Although it is EPA's (United States Environmental Protection Agency) expectation that treatment or engineering controls will be used to address principal threat wastes and that groundwater will be returned to its beneficial use whenever practicable, ICs play an important role in site remedies because they reduce exposure to contamination by limiting land or resource use and guide human behavior at a site.

Government Publication Date: Aug 26, 2020

Emergency Response Notification System: ERNS 1982 TO 1986

Database of oil and hazardous substances spill reports controlled by the National Response Center. The primary function of the National Response Center is to serve as the sole national point of contact for reporting oil, chemical, radiological, biological, and etiological discharges into the environment anywhere in the United States and its territories.

Government Publication Date: 1982-1986

Emergency Response Notification System: ERNS 1987 TO 1989

Database of oil and hazardous substances spill reports controlled by the National Response Center. The primary function of the National Response Center is to serve as the sole national point of contact for reporting oil, chemical, radiological, biological, and etiological discharges into the environment anywhere in the United States and its territories.

Government Publication Date: 1987-1989

Emergency Response Notification System: ERNS

Database of oil and hazardous substances spill reports made available by the United States Coast Guard National Response Center (NRC). The NRC fields initial reports for pollution and railroad incidents and forwards that information to appropriate federal/state agencies for response. These data contain initial incident data that has not been validated or investigated by a federal/state response agency.

Government Publication Date: Nov 9, 2020

The Assessment, Cleanup and Redevelopment Exchange System (ACRES) Brownfield Database: FED BROWNFIELDS

Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties protects the environment, reduces blight, and takes development pressures off greenspaces and working lands. This database is made available by the United States Environmental Protection Agency (EPA).

Government Publication Date: Sep 3, 2019

FEMA Underground Storage Tank Listing: FEMA UST

The Federal Emergency Management Agency (FEMA) of the Department of Homeland Security maintains a list of FEMA owned underground storage tanks.

Government Publication Date: Dec 31, 2017

Petroleum Refineries: REFN

List of petroleum refineries from the U.S. Energy Information Administration (EIA) Refinery Capacity Report. Includes operating and idle petroleum refineries (including new refineries under construction) and refineries shut down during the previous year located in the 50 States, the District of Columbia, Puerto Rico, the Virgin Islands, Guam, and other U.S. possessions. Survey locations adjusted using public data.

Government Publication Date: Jul 10, 2020

Petroleum Product and Crude Oil Rail Terminals: BULK TERMINAL

List of petroleum product and crude oil rail terminals made available by the U.S. Energy Information Administration (EIA). Includes operable bulk petroleum product terminals located in the 50 States and the District of Columbia with a total bulk shell storage capacity of 50,000 barrels or more, and/or the ability to receive volumes from tanker, barge, or pipeline; also rail terminals handling the loading and unloading of crude oil that were active between 2017 and 2018. Petroleum product terminals comes from the EIA-815 Bulk Terminal and Blender Report, which includes working, shell in operation, and shell idle for several major product groupings. Survey locations adjusted using public data.

Government Publication Date: Apr 28, 2020

LIEN on Property: SEMS LIEN

The EPA Superfund Enterprise Management System (SEMS) provides LIEN information on properties under the EPA Superfund Program.

Government Publication Date: Oct 28, 2020

Superfund Decision Documents: SUPERFUND ROD

This database contains a listing of decision documents for Superfund sites. Decision documents serve to provide the reasoning for the choice of (or) changes to a Superfund Site cleanup plan. The decision documents include Records of Decision (ROD), ROD Amendments, Explanations of Significant Differences (ESD), along with other associated memos and files. This information is maintained and made available by the US EPA (Environmental Protection Agency).

Government Publication Date: Sep 22, 2020

State

State Response Sites: RESPONSE

A list of identified confirmed release sites where the Department of Toxic Substances Control (DTSC) is involved in remediation, either in a lead or oversight capacity. These confirmed release sites are generally high-priority and high potential risk. This database is state equivalent NPL.

Government Publication Date: Oct 5, 2020

EnviroStor Database: ENVIROSTOR

The EnviroStor Data Management System is made available by the Department of Toxic Substances Control (DTSC). Includes Corrective Action sites, Tiered Permit sites, Historical Sites and Evaluation/Investigation sites. This database is state equivalent CERCLIS.

Government Publication Date: Oct 5, 2020

Delisted State Response Sites: DELISTED ENVS

Sites removed from the list of State Response Sites made available by the EnviroStor Data Management System, Department of Toxic Substances Control (DTSC).

Government Publication Date: Oct 5, 2020

Solid Waste Information System (SWIS): SWF/LF

The Solid Waste Information System (SWIS) database made available by the Department of Resources Recycling and Recovery (CalRecycle) contains information on solid waste facilities, operations, and disposal sites throughout the State of California. The types of facilities found in this database include landfills, transfer stations, material recovery facilities, composting sites, transformation facilities, waste tire sites, and closed disposal sites.

Government Publication Date: Oct 15, 2020

EnviroStor Hazardous Waste Facilities: HWP

A list of hazardous waste facilities including permitted, post-closure and historical facilities found in the Department of Toxic Substances Control (DTSC) EnviroStor database.

Government Publication Date: Oct 5, 2020

Sites Listed in the Solid Waste Assessment Test (SWAT) Program Report: SWAT

In a 1993 Memorandum of Understanding, the State Water Resources Control Board (SWRCB) agreed to submit a comprehensive report on the Solid Waste Assessment Test (SWAT) Program to the California Integrated Waste Management Board (CIWMB). This report summarizes the work completed to date on the SWAT Program, and addresses both the impacts that leakage from solid waste disposal sites (SWDS) may have upon waters of the State and the actions taken to address such leakage.

Government Publication Date: Dec 31, 1995

Land Disposal Sites: LDS

Land Disposal Sites in GeoTracker, the State Water Resources Control Board (SWRCB)'s data management system. The Land Disposal program regulates of waste discharge to land for treatment, storage and disposal in waste management units. Waste management units include waste piles, surface impoundments, and landfills.

Government Publication Date: Nov 16, 2020

Leaking Underground Fuel Tank Reports: LUST

List of Leaking Underground Storage Tanks within the Cleanup Sites data in GeoTracker database. GeoTracker is the State Water Resources Control Board's (SWRCB) data management system for managing sites that impact groundwater, especially those that require groundwater cleanup (Underground Storage Tanks, Department of Defense and Site Cleanup Program) as well as permitted facilities such as operating Underground Storage Tanks. The Leak Prevention Program that overlooks LUST sites is the SWRCB in California's Environmental Protection Agency.

Government Publication Date: Nov 16, 2020

Delisted Leaking Storage Tanks: DELISTED LST

List of Leaking Underground Storage Tanks (LUST) cleanup sites removed from GeoTracker, the State Water Resources Control Board (SWRCB)'s database system, as well as sites removed from the SWRCB's list of UST Case closures.

Government Publication Date: Nov 16, 2020

Solid Waste Disposal Sites with Waste Constituents Above Hazardous Waste Levels: SWRCB SWF

This is a list of solid waste disposal sites identified by California State Water Resources Control Board with waste constituents above hazardous waste levels outside the waste management unit.

Government Publication Date: Sep 20, 2006

Permitted Underground Storage Tank (UST) in GeoTracker: UST

List of Permitted Underground Storage Tank (UST) sites made available by the State Water Resources Control Board (SWRCB) in California's Environmental Protection Agency (EPA).

Government Publication Date: Nov 16, 2020

Proposed Closure of Underground Storage Tank Cases: UST CLOSURE

List of UST cases that are being considered for closure by either the California Environmental Protection Agency, State Water Resources Control Board or the Executive Director that have been posted for a 60-day public comment period.

Government Publication Date: Oct 7, 2020

Historical Hazardous Substance Storage Information Database: HHSS

The Historical Hazardous Substance Storage database contains information collected in the 1980s from facilities that stored hazardous substances. The information was originally collected on paper forms, was later transferred to microfiche, and recently indexed as a searchable database. When using this database, please be aware that it is based upon self-reported information submitted by facilities which has not been independently verified. It is unlikely that every facility responded to the survey and the database should not be expected to be a complete inventory of all facilities that were operating at that time. This database is maintained by the California State Water Resources Control Board's (SWRCB) Geotracker.

Government Publication Date: Aug 27, 2015

Aboveground Storage Tanks: AST

A statewide list from 2009 of aboveground storage tanks (ASTs) made available by the Cal FIRE Office of the State Fire Marshal (OSFM). This list is no longer maintained or updated by the Cal FIRE OSFM.

Government Publication Date: Aug 31, 2009

SWRCB Historical Aboveground Storage Tanks: AST SWRCB

A list of aboveground storage tanks made available by the California State Water Resources Control Board (SWRCB). Effective January 1, 2008, the Certified Unified Program Agencies (CUPAs) are vested with the responsibility and authority to implement the Aboveground Petroleum Storage Act (APSA).

Government Publication Date: Dec 1, 2007

Oil and Gas Facility Tanks: TANK OIL GAS

Locations of oil and gas tanks that fall under the jurisdiction of the Geologic Energy Management Division of the California Department of Conservation (CalGEM) (CCR 1760). CalGEM was formerly the Division of Oil, Gas, and Geothermal Resources (DOGGR).

Government Publication Date: Dec 3, 2020

Delisted Storage Tanks: DELISTED TNK

This database contains a list of storage tank sites that were removed by the State Water Resources Control Board (SWRCB) in California's Environmental Protection Agency (EPA) and the Cal FIRE Office of State Fire Marshal (OSFM).

Government Publication Date: Dec 3, 2020

California Environmental Reporting System (CERS) Tanks: CERS TANK

List of sites in the California Environmental Protection Agency (CalEPA) Regulated Site Portal which fall under the Aboveground Petroleum Storage and Underground Storage Tank regulatory programs. The CalEPA oversees the statewide implementation of the Unified Program which applies regulatory standards to protect Californians from hazardous waste and materials.

Government Publication Date: Oct 26, 2020

Site Mitigation and Brownfields Reuse Program Facility Sites with Land Use Restrictions: LUR

The Department of Toxic Substances Control (DTSC) Site Mitigation and Brownfields Reuse Program (SMBRP) list includes sites cleaned up under the program's oversight and generally does not include current or former hazardous waste facilities that required a hazardous waste facility permit. The list represents land use restrictions that are active. Some sites have multiple land use restrictions.

Government Publication Date: Oct 5, 2020

Hazardous Waste Management Program Facility Sites with Deed / Land Use Restrictions: HLUR

The Department of Toxic Substances Control (DTSC) Hazardous Waste Management Program (HWMP) has developed a list of current or former hazardous waste facilities that have a recorded land use restriction at the local county recorder's office. The land use restrictions on this list were required by the DTSC HWMP as a result of the presence of hazardous substances that remain on site after the facility (or part of the facility) has been closed or cleaned up. The types of land use restriction include deed notice, deed restriction, or a land use restriction that binds current and future owners.

Government Publication Date: Oct 16, 2020

Deed Restrictions and Land Use Restrictions: DEED

List of Deed Restrictions, Land Use Restrictions and Covenants in GeoTracker made available by the State Water Resources Control Board (SWRCB) in California's Environmental Protection Agency. A deed restriction (land use covenant) may be required to facilitate the remediation of past environmental contamination and to protect human health and the environment by reducing the risk of exposure to residual hazardous materials.

Government Publication Date: Nov 16, 2020

Voluntary Cleanup Program: VCP

List of sites in the Voluntary Cleanup Program made available by the Department of Toxic Substances and Control (DTSC). The Voluntary Cleanup Program was designed to respond to lower priority sites. Under the Voluntary Cleanup Program, DTSC enters site-specific agreements with project proponents for DTSC oversight of site assessment, investigation, and/or removal or remediation activities, and the project proponents agree to pay DTSC's reasonable costs for those services.

Government Publication Date: Oct 5, 2020

GeoTracker Cleanup Program Sites: CLEANUP SITES

A list of Cleanup Program sites in the state of California made available by The State Water Resources Control Board (SWRCB) of the California Environmental Protection Agency (EPA). SWRCB tracks leaking underground storage tank cleanups as well as other water board cleanups.

Government Publication Date: Nov 16, 2020

Delisted County Records: DELISTED COUNTY

Records removed from county or CUPA databases. Records may be removed from the county lists made available by the respective county departments because they are inactive, or because they have been deemed to be below reportable thresholds.

Government Publication Date: Jan 5, 2021

Delisted California Environmental Reporting System (CERS) Tanks: DELISTED CTNK

This database contains a list of Aboveground Petroleum Storage and Underground Storage Tank sites that were removed from in the California Environmental Protection Agency (CalEPA) Regulated Site Portal.

Government Publication Date: Oct 26, 2020

Historical Hazardous Substance Storage Container Information - Facility Summary: HIST TANK

The State Water Resources Control Board maintained the Hazardous Substance Storage Containers listing and inventory in th 1980s. This facility summary lists historic tank sites where the following container types were present: farm motor vehicle fuel tanks; waste tanks; sumps; pits, ponds, lagoons, and others; and all other product tanks. This set, published in May 1988, lists facility and owner information, as well as the number of containers. This data is historic and will not be updated.

Government Publication Date: May 27, 1988

Tribal

Leaking Underground Storage Tanks (LUSTs) on Indian Lands: INDIAN LUST

LUSTs on Tribal/Indian Lands in Region 9, which includes California.

Government Publication Date: Apr 8, 2020

Underground Storage Tanks (USTs) on Indian Lands: INDIAN UST

USTs on Tribal/Indian Lands in Region 9, which includes California.

Government Publication Date: Apr 8, 2020

Delisted Tribal Leaking Storage Tanks: DELISTED ILST

Leaking Underground Storage Tank facilities which have been removed from the Regional Tribal LUST lists made available by the EPA.

Government Publication Date: Apr 14, 2020

Delisted Tribal Underground Storage Tanks: DELISTED IUST

Underground Storage Tank facilities which have been removed from the Regional Tribal UST lists made available by the EPA.

Government Publication Date: Apr 14, 2020

County

Merced County - CUPA Facilities List: MERCED CUPA

A list of facilities associated with various Certified Unified Program Agency (CUPA) programs in the County of Merced. This list is made available by Merced County which has been certified by CalEPA to implement the Unified program as a CUPA for the entire county.

Government Publication Date: Sep 19, 2019

Santa Clara County - Historic Solvent Case Listing: SANTACLARA HSOL

The Santa Clara Valley Water District was responsible for the oversight of solvent and toxic release cases and maintained a list of historic solvent cases in Santa Clara County.

Government Publication Date: Aug 22, 2016

Santa Clara County - Local Oversight Program Listing: SANTACLARA LO

A list of Leaking Underground Storage Tanks (LUST) facilities in Santa Clara County Provided by Santa Clara Department of Environmental Health (DEH). Since July 1, 2004 the DEH has served as the oversight agency for investigations and clean-up of petroleum releases from underground storage tanks through implementation of the Local Oversight Program (LOP) contract with the State Water Resources Control Board.

Government Publication Date: Jun 14, 2017

Santa Clara County - Underground Storage Tanks: UST SANTACLARA

List of underground storage tanks made available by the County of Santa Clara's Hazardous Materials Compliance Division.

Government Publication Date: Nov 17, 2020

Santa Clara County - CUPA Facilities List: SANTACLARA CUPA

A list of facilities associated with various Certified Unified Program Agency (CUPA) programs in Santa Clara County. This list is made available by Santa Clara County Department of Environmental health (DEH). DEH's Hazardous Materials Compliance Division (HMCD) is CUPA for the county with jurisdiction within the Cities of Los Altos Hills, Monte Sereno, and Saratoga; and in all unincorporated areas of Santa Clara County, including Moffett Field, San Martin, and Stanford.

Government Publication Date: Dec 9, 2020

Santa Clara County - City of San Jose Hazardous Material Facilities: SANJOSE HM

A list of facilities with hazardous materials, including underground and aboveground tanks. This list is maintained by the City of San Jose Fire Department.

Government Publication Date: Oct 15, 2020

Santa Clara County - Gilroy City CUPA Facilities List: GILROY CUPA

The Gilroy City Fire Marshal's office maintains a list of CUPA Facilities located in Gilroy City.

Government Publication Date: Sep 21, 2020

Santa Clara County - Sunnyvale City CUPA List: SUNNYVALE CUPA

A list of facilities associated with various Certified Unified Program Agency (CUPA) programs in Sunnyvale City, Santa Clara County. This list is made available by the Fire Prevention & Hazardous Materials division of the Sunnyvale Department of Public Safety.

Government Publication Date: Jul 16, 2019

Stanislaus County - CUPA List: STANISLAUS CUPA

The Environmental Resources Department of Stanislaus County maintains a list of Certified Unified Program Agency (CUPA) facilities.

Government Publication Date: Dec 11, 2020

Additional Environmental Record Sources

Federal

PFOA/PFOS Contaminated Sites: PFAS NPL

List of sites where PFOA or PFOS contaminants have been found in drinking water or soil. Made available by the Federal Environmental Protection Agency (EPA).

Government Publication Date: Nov 18, 2020

Facility Registry Service/Facility Index: FINDS/FRS

The Facility Registry Service (FRS) is a centrally managed database that identifies facilities, sites, or places subject to environmental regulations or of environmental interest. FRS creates high-quality, accurate, and authoritative facility identification records through rigorous verification and management procedures that incorporate information from program national systems, state master facility records, and data collected from EPA's Central Data Exchange registrations and data management personnel. This list is made available by the Environmental Protection Agency (US EPA).

Government Publication Date: Nov 2, 2020

Toxics Release Inventory (TRI) Program: TRIS

The EPA's Toxics Release Inventory (TRI) is a database containing data on disposal or other releases of over 650 toxic chemicals from thousands of U. S. facilities and information about how facilities manage those chemicals through recycling, energy recovery, and treatment. One of TRI's primary purposes is to inform communities about toxic chemical releases to the environment.

Government Publication Date: Feb 19, 2020

Perfluorinated Alkyl Substances (PFAS) Releases: PFAS TRI

List of Toxics Release Inventory (TRI) facilities at which the reported chemical is a Per- or polyfluorinated alkyl substance (PFAS) included in the Environmental Protection Agency (EPA)'s consolidated PFAS Master List of PFAS Substances. The EPA's Toxics Release Inventory (TRI) is a database containing data on disposal or other releases of over 650 toxic chemicals from thousands of U.S. facilities and information about how facilities manage those chemicals through recycling, energy recovery, and treatment.

Government Publication Date: Feb 19, 2020

Perfluorinated Alkyl Substances (PFAS) Water Quality: PFAS WATER

The Water Quality Portal (WQP) is a cooperative service sponsored by the United States Geological Survey (USGS), the Environmental Protection Agency (EPA), and the National Water Quality Monitoring Council (NWQMC). This listing includes records from the Water Quality Portal where the characteristic (environmental measurement) is in the Environmental Protection Agency (EPA)'s consolidated PFAS Master List of PFAS Substances.

Government Publication Date: Jul 20, 2020

Hazardous Materials Information Reporting System: HMIRS

US DOT - Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA) Incidents Reports Database taken from Hazmat Intelligence Portal, U.S. Department of Transportation.

Government Publication Date: Sep 1, 2020

National Clandestine Drug Labs: NCDL

The U.S. Department of Justice ("the Department") provides this data as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy.

Government Publication Date: Oct 5, 2020

Toxic Substances Control Act: TSCA

The Environmental Protection Agency (EPA) is amending the Toxic Substances Control Act (TSCA) section 8(a) Inventory Update Reporting (IUR) rule and changing its name to the Chemical Data Reporting (CDR) rule.

The CDR enables EPA to collect and publish information on the manufacturing, processing, and use of commercial chemical substances and mixtures (referred to hereafter as chemical substances) on the TSCA Chemical Substance Inventory (TSCA Inventory). This includes current information on chemical substance production volumes, manufacturing sites, and how the chemical substances are used. This information helps the Agency determine whether people or the environment are potentially exposed to reported chemical substances. EPA publishes submitted CDR data that is not Confidential Business Information (CBI).

Government Publication Date: Apr 11, 2019

Hist TSCA: HIST TSCA

The Environmental Protection Agency (EPA) is amending the Toxic Substances Control Act (TSCA) section 8(a) Inventory Update Reporting (IUR) rule and changing its name to the Chemical Data Reporting (CDR) rule.

The 2006 IUR data summary report includes information about chemicals manufactured or imported in quantities of 25,000 pounds or more at a single site during calendar year 2005. In addition to the basic manufacturing information collected in previous reporting cycles, the 2006 cycle is the first time EPA collected information to characterize exposure during manufacturing, processing and use of organic chemicals. The 2006 cycle also is the first time manufacturers of inorganic chemicals were required to report basic manufacturing information.

Government Publication Date: Dec 31, 2006

FTTS Administrative Case Listing: FTTS ADMIN

An administrative case listing from the Federal Insecticide, Fungicide, & Rodenticide Act (FIFRA) and Toxic Substances Control Act (TSCA), together known as FTTS. This database was obtained from the Environmental Protection Agency's (EPA) National Compliance Database (NCDB). The FTTS and NCDB was shut down in 2006.

Government Publication Date: Jan 19, 2007

FTTS Inspection Case Listing: FTTS INSP

An inspection case listing from the Federal Insecticide, Fungicide, & Rodenticide Act (FIFRA) and Toxic Substances Control Act (TSCA), together known as FTTS. This database was obtained from the Environmental Protection Agency's (EPA) National Compliance Database (NCDB). The FTTS and NCDB was shut down in 2006.

Government Publication Date: Jan 19, 2007

Potentially Responsible Parties List: PRP

Early in the cleanup process, the Environmental Protection Agency (EPA) conducts a search to find the potentially responsible parties (PRPs). EPA looks for evidence to determine liability by matching wastes found at the site with parties that may have contributed wastes to the site.

Government Publication Date: Dec 30, 2020

State Coalition for Remediation of Drycleaners Listing: SCRD DRYCLEANER

The State Coalition for Remediation of Drycleaners (SCRD) was established in 1998, with support from the U.S. Environmental Protection Agency (EPA) Office of Superfund Remediation and Technology Innovation. Coalition members are states with mandated programs and funding for drycleaner site remediation. Current members are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Government Publication Date: Nov 08, 2017

Integrated Compliance Information System (ICIS): ICIS

The Integrated Compliance Information System (ICIS) is a system that provides information for the Federal Enforcement and Compliance (FE&C) and the National Pollutant Discharge Elimination System (NPDES) programs. The FE&C component supports the Environmental Protection Agency's (EPA) Civil Enforcement and Compliance program activities. These activities include Compliance Assistance, Compliance Monitoring and Enforcement. The NPDES program supports tracking of NPDES permits, limits, discharge monitoring data and other program reports.

Government Publication Date: Aug 24, 2020

Drycleaner Facilities: FED DRYCLEANERS

A list of drycleaner facilities from Enforcement and Compliance History Online (ECHO) online search. The Environmental Protection Agency (EPA) tracks facilities that possess NAIC and SIC codes that classify businesses as drycleaner establishments.

Government Publication Date: Jan 20, 2020

Delisted Drycleaner Facilities: DELISTED FED DRY

List of sites removed from the list of Drycleaner Facilities (sites in the EPA's Integrated Compliance Information System (ICIS) with NAIC or SIC codes identifying the business as a drycleaner establishment).

Government Publication Date: Jan 20, 2020

Formerly Used Defense Sites: FUDS

Formerly Used Defense Sites (FUDS) are properties that were formerly owned by, leased to, or otherwise possessed by and under the jurisdiction of the Secretary of Defense prior to October 1986, where the Department of Defense (DoD) is responsible for an environmental restoration. This list is published by the U.S. Army Corps of Engineers.

Government Publication Date: Jan 28, 2020

PHMSA Pipeline Safety Flagged Incidents: PIPELINE INCIDENT

A list of flagged pipeline incidents made available by the U.S. Department of Transportation (US DOT) Pipeline and Hazardous Materials Safety Administration (PHMSA). PHMSA regulations require incident and accident reports for five different pipeline system types.

Government Publication Date: Jul 7, 2020

Material Licensing Tracking System (MLTS): MLTS

A list of sites that store radioactive material subject to the Nuclear Regulatory Commission (NRC) licensing requirements. This list is maintained by the NRC. As of September 2016, the NRC no longer releases location information for sites. Site locations were last received in July 2016.

Government Publication Date: Aug 5, 2020

Historic Material Licensing Tracking System (MLTS) sites: HIST MLTS

A historic list of sites that have inactive licenses and/or removed from the Material Licensing Tracking System (MLTS). In some cases, a site is removed from the MLTS when the state becomes an "Agreement State". An Agreement State is a State that has signed an agreement with the Nuclear Regulatory Commission (NRC) authorizing the State to regulate certain uses of radioactive materials within the State.

Government Publication Date: Jan 31, 2010

Mines Master Index File: MINES

The Master Index File (MIF) contains mine identification numbers issued by the Department of Labor Mine Safety and Health Administration (MSHA) for mines active or opened since 1971. Note that addresses may or may not correspond with the physical location of the mine itself.

Government Publication Date: Nov 3, 2020

Alternative Fueling Stations: ALT FUELS

List of alternative fueling stations made available by the US Department of Energy's Office of Energy Efficiency & Renewable Energy. Includes Biodiesel stations, Ethanol (E85) stations, Liquefied Petroleum Gas (Propane) stations, Ethanol (E85) stations, Natural Gas stations, Hydrogen stations, and Electric Vehicle Supply Equipment (EVSE). The National Renewable Energy Laboratory (NREL) obtains information about new stations from trade media, Clean Cities coordinators, a Submit New Station form on the Station Locator website, and through collaborating with infrastructure equipment and fuel providers, original equipment manufacturers (OEMs), and industry groups.

Government Publication Date: Sep 24, 2020

Registered Pesticide Establishments: SSTS

List of active EPA-registered foreign and domestic pesticide-producing and device-producing establishments based on data from the Section Seven Tracking System (SSTS). The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Section 7 requires that facilities producing pesticides, active ingredients, or devices be registered. The list of establishments is made available by the EPA.

Government Publication Date: Mar 31, 2020

Polychlorinated Biphenyl (PCB) Notifiers: PCB

Facilities included in the national list of facilities that have notified the United States Environmental Protection Agency (EPA) of Polychlorinated Biphenyl (PCB) activities. Any company or person storing, transporting or disposing of PCBs or conducting PCB research and development must notify the EPA and receive an identification number.

Government Publication Date: Nov 19, 2020

State

Dry Cleaning Facilities: DRYCLEANERS

A list of drycleaner related facilities that have EPA ID numbers. These are facilities with certain SIC codes: power laundries, family and commercial, linen supply, commercial laundry, dry cleaning and pressing machines - Coin Operated Laundry and Dry Cleaning. This is provided by the Department of Toxic Substance Control.

Government Publication Date: Nov 10, 2020

Delisted Drycleaners: DELISTED DRYCLEANERS

Sites removed from the list of drycleaner related facilities that have EPA ID numbers, made available by the California Department of Toxic Substance Control.

Government Publication Date: Nov 10, 2020

Non-Toxic Dry Cleaning Incentive Program: DRYC GRANT

A list of grant recipients of the Non-Toxic Dry Cleaning Incentive Program made available by the California Air Resources Board (CARB). The program provides grants to eligible dry cleaning businesses to assist them in transitioning away from PERC machines to alternative non-toxic and non-smog forming technologies.

Government Publication Date: Feb 28, 2018

Per- and Polyfluoroalkyl Substances (PFAS): PFAS

List of sites from the State Water Resources Control Board (SWRCB)'s GeoTracker at which one or more of the potential contaminants of concern are in the PFAS Master List of PFAS Substances made available by the Environmental Protection Agency (US EPA).

Government Publication Date: Nov 16, 2020

PFOA/PFOS Groundwater: PFAS GW

A list of water wells from the Groundwater Ambient Monitoring and Assessment Program (GAMA) Groundwater Information System with the groundwater chemical perfluorooctanoic acid (PFOA) (NL = 0.014 UG/L) or perfluorooctanoic sulfonate (PFOS) (NL = 0.013 UG/L). The GAMA Groundwater Information System search is made available by California Water Boards.

Government Publication Date: Oct 22, 2020

Hazardous Waste and Substances Site List - Site Cleanup: HWSS CLEANUP

The Hazardous Waste and Substances Sites (Cortese) List is a planning document used by the State, local agencies and developers to comply with the California Environmental Quality Act requirements in providing information about the location of hazardous materials release sites. This list is published by California Department of Toxic Substance Control.

Government Publication Date: Nov 10, 2020

List of Hazardous Waste Facilities Subject to Corrective Action: DTSC HWF

This is a list of hazardous waste facilities identified in Health and Safety Code (HSC) § 25187.5. These facilities are those where Department of Toxic Substances Control (DTSC) has taken or contracted for corrective action because a facility owner/operator has failed to comply with a date for taking corrective action in an order issued under HSC § 25187, or because DTSC determined that immediate corrective action was necessary to abate an imminent or substantial endangerment.

Government Publication Date: Jul 18, 2016

EnviroStor Inspection, Compliance, and Enforcement: INSP COMP ENF

A list of permitted facilities with inspections and enforcements tracked in the Department of Toxic Substance Control (DTSC) EnviroStor.

Government Publication Date: Oct 7, 2020

School Property Evaluation Program Sites: SCH

A list of sites registered with The Department of Toxic Substances Control (DTSC) School Property Evaluation and Cleanup (SPEC) Division. SPEC is responsible for assessing, investigating and cleaning up proposed school sites. The Division ensures that selected properties are free of contamination or, if the properties were previously contaminated, that they have been cleaned up to a level that protects the students and staff who will occupy the new school.

Government Publication Date: Oct 5, 2020

California Hazardous Material Incident Report System (CHMIRS): CHMIRS

A list of reported hazardous material incidents, spills, and releases from the California Hazardous Material Incident Report System (CHMIRS). This list has been made available by the California Office of Emergency Services (OES).

Government Publication Date: Oct 12, 2020

Hazardous Waste Manifest Data: HAZNET

A list of hazardous waste manifests received each year by Department of Toxic Substances Control (DTSC). The volume of manifests is typically 900,000 - 1,000,000 annually, representing approximately 450,000 - 500,000 shipments.

Government Publication Date: Oct 24, 2016

Historical California Hazardous Material Incident Report System (CHMIRS): HIST CHMIRS

A list of reported hazardous material incidents, spills, and releases from the California Hazardous Material Incident Report System (CHMIRS) prior to 1993. This list has been made available by the California Office of Emergency Services (OES).

Government Publication Date: Jan 1, 1993

Historical Hazardous Waste Manifest Data: HIST MANIFEST

A list of historic hazardous waste manifests received by the Department of Toxic Substances Control (DTSC) from year the 1980 to 1992. The volume of manifests is typically 900,000 - 1,000,000 annually, representing approximately 450,000 - 500,000 shipments.

Government Publication Date: Dec 31, 1992

Historical Cortese List: HIST CORTESE

List of sites which were once included on the Cortese list. The Hazardous Waste and Substances Sites (Cortese) List is a planning document used by the State, local agencies and developers to comply with the California Environmental Quality Act requirements for providing information about the location of hazardous sites.

Government Publication Date: Nov 13, 2008

Cease and Desist Orders and Cleanup and Abatement Orders: CDO/CAO

The California Environment Protection Agency "Cortese List" of active Cease and Desist Orders (CDO) and Cleanup and Abatement Orders (CAO). This list contains many CDOs and CAOs that do NOT concern the discharge of wastes that are hazardous materials. Many of the listed orders concern, as examples, discharges of domestic sewage, food processing wastes, or sediment that do not contain hazardous materials, but the Water Boards' database does not distinguish between these types of orders.

Government Publication Date: Feb 16, 2012

California Environmental Reporting System (CERS) Hazardous Waste Sites: CERS HAZ

List of sites in the California Environmental Protection Agency (CalEPA) Regulated Site Portal which fall under the following regulatory programs: Hazardous Chemical Management, Hazardous Waste Onsite Treatment, Household Hazardous Waste Collection, Hazardous Waste Generator, RCRA LQ HW Generator. The CalEPA oversees the statewide implementation of the Unified Program which applies regulatory standards to protect Californians from hazardous waste and materials.

Government Publication Date: Oct 26, 2020

Delisted Environmental Reporting System (CERS) Hazardous Waste Sites: DELISTED HAZ

This database contains a list of sites that were removed from the California Environmental Protection Agency (CalEPA) in the following regulatory programs: Hazardous Chemical Management, Hazardous Waste Onsite Treatment, Household Hazardous Waste Collection, Hazardous Waste Generator, RCRA LQ HW Generator.

Government Publication Date: Nov 29, 2018

Sites in GeoTracker: GEOTRACKER

GeoTracker is the State Water Resource Control Boards' data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater. This is a list of sites in GeoTracker that aren't otherwise categorized as LUST, Land Disposal Sites (LDS), Cleanup Sites, or sites having Waste Discharge Requirements (WDR). This listing includes program types such as Underground Injection Control (UIC), Confined Animal Facilities (CAF), Irrigated Lands Regulatory Program, plans, and non-case information.

Government Publication Date: Nov 16, 2020

Waste Discharge Requirements: WASTE DISCHG

List of sites in California State Water Resources Control Board (SWRCB) Waste Discharge Requirements (WDRs) Program in California, made available by the SWRCB via GeoTracker. The WDR program regulates point discharges that are exempt pursuant to Subsection 20090 of Title 27 and not subject to the Federal Water Pollution Control Act. The scope of the WDRs Program also includes the discharge of wastes classified as inert, pursuant to section 20230 of Title 27.

Government Publication Date: Nov 16, 2020

Toxic Pollutant Emissions Facilities: EMISSIONS

A list of criteria and toxic pollutant emissions data for facilities in California made available by the California Environmental Protection Agency - Air Resources Board (ARB). Risk data may be based on previous inventory submittals. The toxics data are submitted to the ARB by the local air districts as requirement of the Air Toxics "Hot Spots" Program. This program requires emission inventory updates every four years.

Government Publication Date: Dec 31, 2018

Clandestine Drug Lab Sites: CDL

The Department of Toxic Substances Control (DTSC) maintains a listing of drug lab sites. DTSC is responsible for removal and disposal of hazardous substances discovered by law enforcement officials while investigating illegal/clandestine drug laboratories.

Government Publication Date: Jun 30, 2018

Tribal

No Tribal additional environmental record sources available for this State.

County

No County additional environmental databases were selected to be included in the search.

Definitions

Database Descriptions: This section provides a detailed explanation for each database including: source, information available, time coverage, and acronyms used. They are listed in alphabetic order.

Detail Report: This is the section of the report which provides the most detail for each individual record. Records are summarized by location, starting with the project property followed by records in closest proximity.

Distance: The distance value is the distance between plotted points, not necessarily the distance between the sites' boundaries. All values are an approximation.

Direction: The direction value is the compass direction of the site in respect to the project property and/or center point of the report.

Elevation: The elevation value is taken from the location at which the records for the site address have been plotted. All values are an approximation. Source: Google Elevation API.

Executive Summary: This portion of the report is divided into 3 sections:

'Report Summary'- Displays a chart indicating how many records fall on the project property and, within the report search radii.

'Site Report Summary'-Project Property'- This section lists all the records which fall on the project property. For more details, see the 'Detail Report' section.

'Site Report Summary-Surrounding Properties'- This section summarizes all records on adjacent properties, listing them in order of proximity from the project property. For more details, see the 'Detail Report' section.

Map Key: The map key number is assigned according to closest proximity from the project property. Map Key numbers always start at #1. The project property will always have a map key of '1' if records are available. If there is a number in brackets beside the main number, this will indicate the number of records on that specific property. If there is no number in brackets, there is only one record for that property.

The symbol and colour used indicates 'elevation': the red inverted triangle will dictate 'ERIS Sites with Lower Elevation', the yellow triangle will dictate 'ERIS Sites with Higher Elevation' and the orange square will dictate 'ERIS Sites with Same Elevation.'

Unplottables: These are records that could not be mapped due to various reasons, including limited geographic information. These records may or may not be in your study area, and are included as reference.

PSR
PHYSICAL SETTING REPORT

Property Information

Order Number:		21012500379p
Date Completed:		January 26, 2021
Project Number:		184030902 task 006.061.6.
Project Property:		Pacheco Dam Pacheco Dam Pacheco Creek CA 95023
Coordinates:		
	Latitude:	36.9771708
	Longitude:	-121.4602147
	UTM Northing:	4107402.52835 Meters
	UTM Easting:	650919.778474 Meters
	UTM Zone:	UTM Zone 10S
	Elevation:	1,224.15 ft
	Slope Direction:	W

Topographic Information....2
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Geologic Information....128
Soil Information....155
Wells and Additional Sources....224
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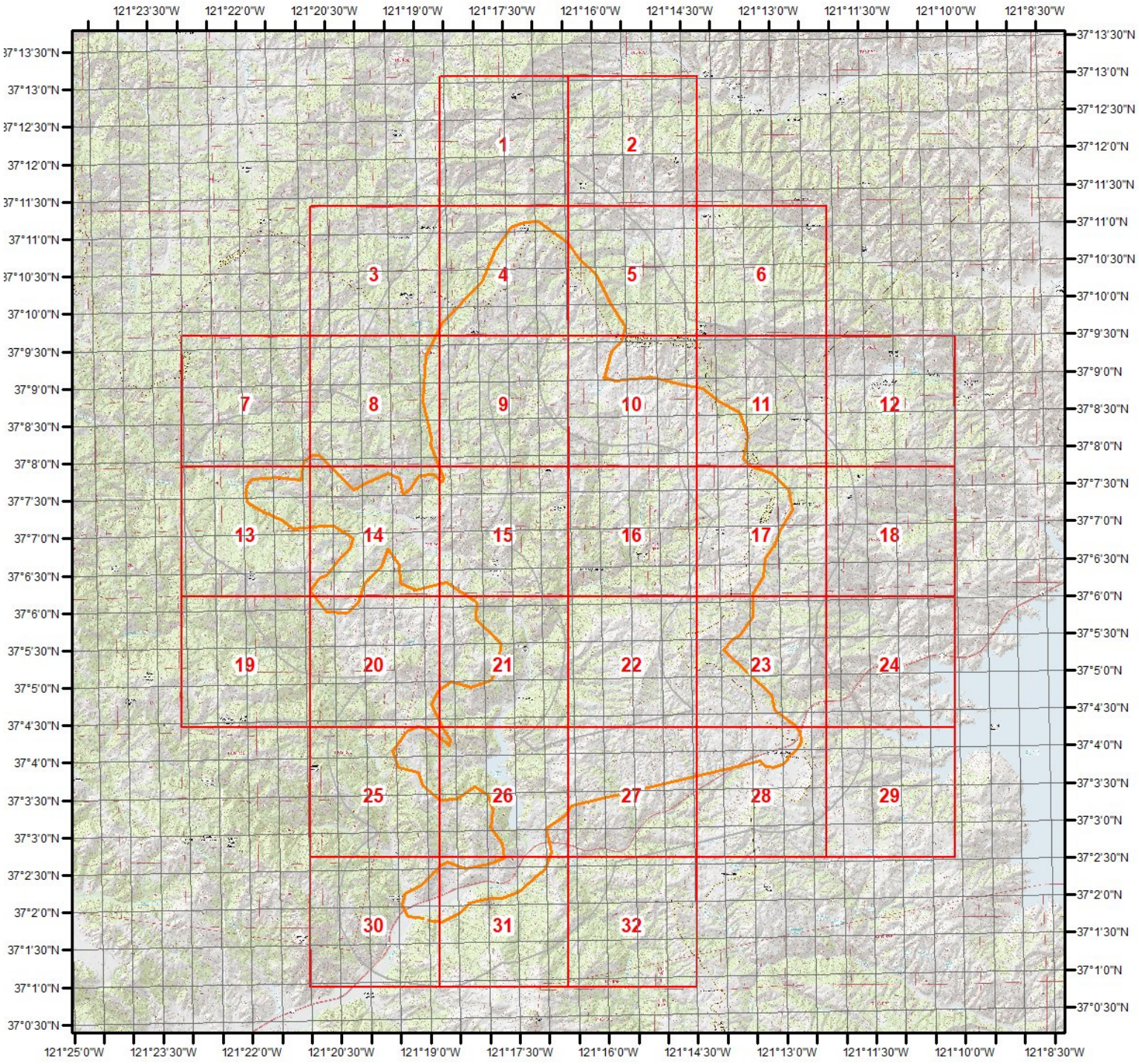
The ERIS ***Physical Setting Report - PSR*** provides comprehensive information about the physical setting around a site and includes a complete overview of topography and surface topology, in addition to hydrologic, geologic and soil characteristics. The location and detailed attributes of oil and gas wells, water wells, public water systems and radon are also included for review.

The compilation of both physical characteristics of a site and additional attribute data is useful in assessing the impact of migration of contaminants and subsequent impact on soils and groundwater.

Disclaimer

This Report does not provide a full environmental evaluation for the site or adjacent properties. Please see the terms and disclaimer at the end of the Report for greater detail.

Topographic Information



Current USGS Topo (2015)

0 0.4 0.8 1.6 2.4 3.2 4 4.8 Miles

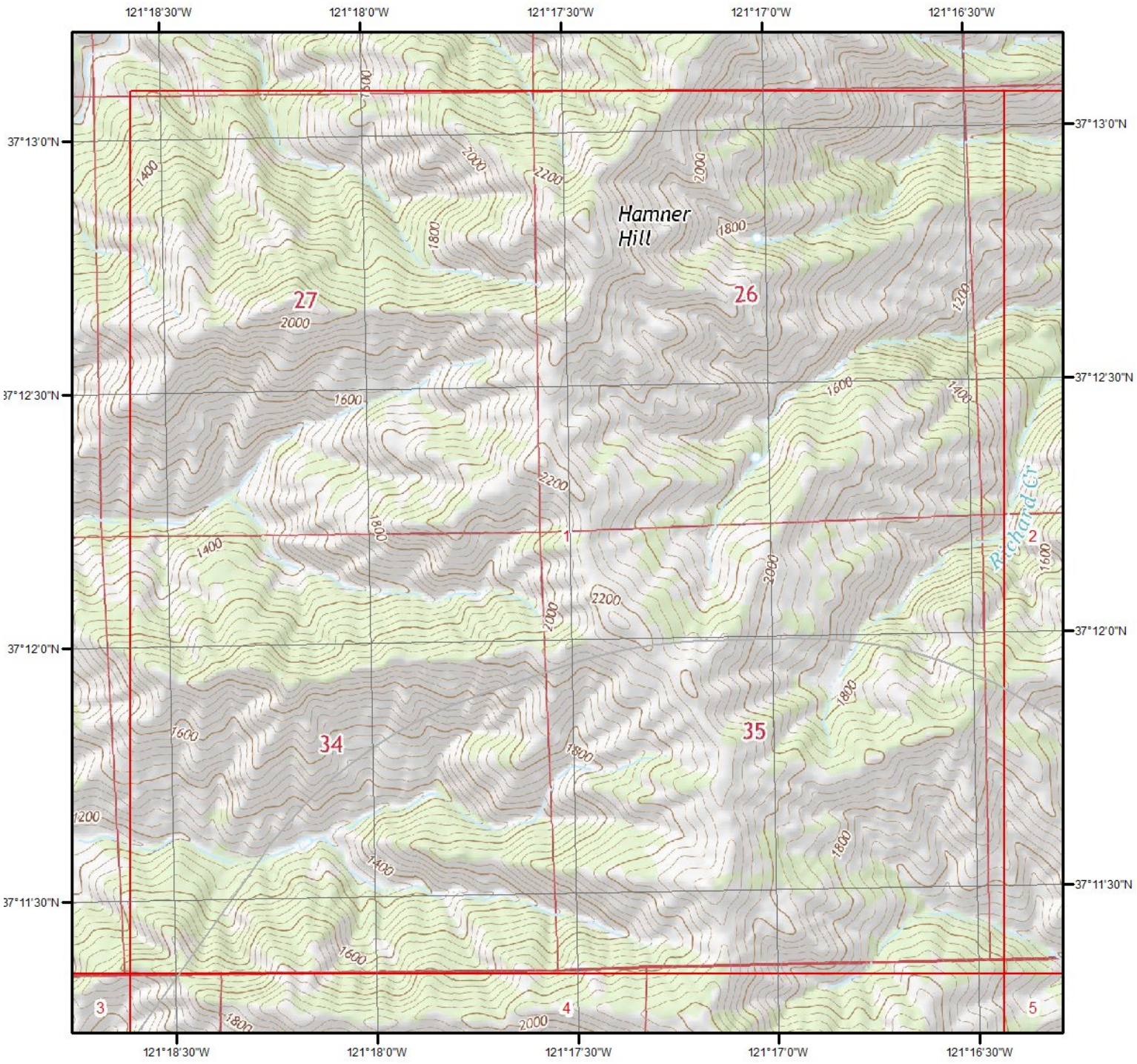
N

Quadrangle(s): Crevison Peak,CA; Gilroy Hot Springs,CA; Howard Ranch,CA; Los Banos Valley,CA; Mariposa Peak,CA; Mississippi Creek,CA; Mou

Source: USGS 7.5 Minute Topographic Map

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Topographic Information



Current USGS Topo - Page 1

0 0.2 0.4 0.8 Miles

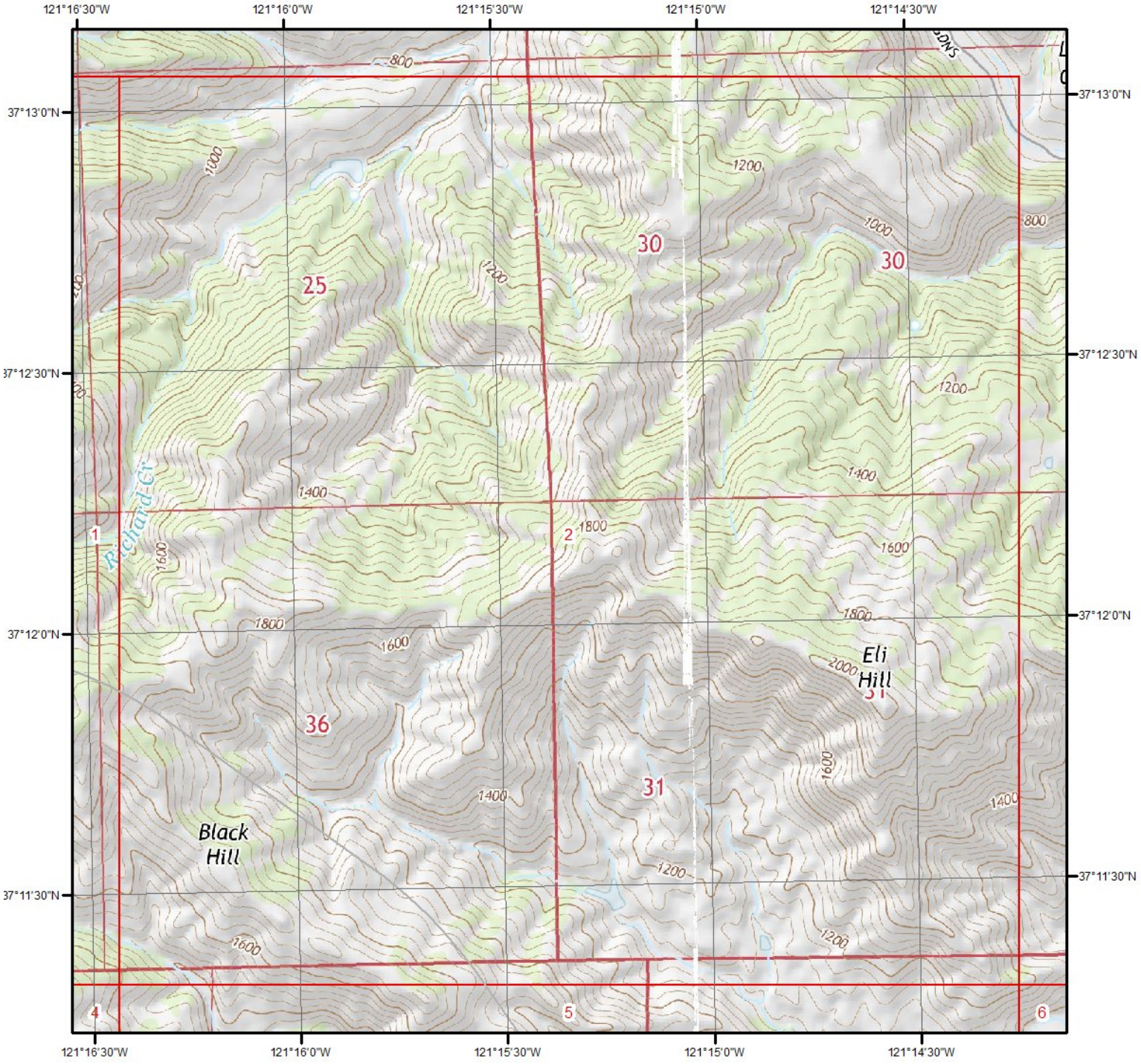
N

Quadrangle(s): Mustang Peak,CA

Source: USGS 7.5 Minute Topographic Map

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Topographic Information



Current USGS Topo - Page 2

0 0.2 0.4 0.8 Miles

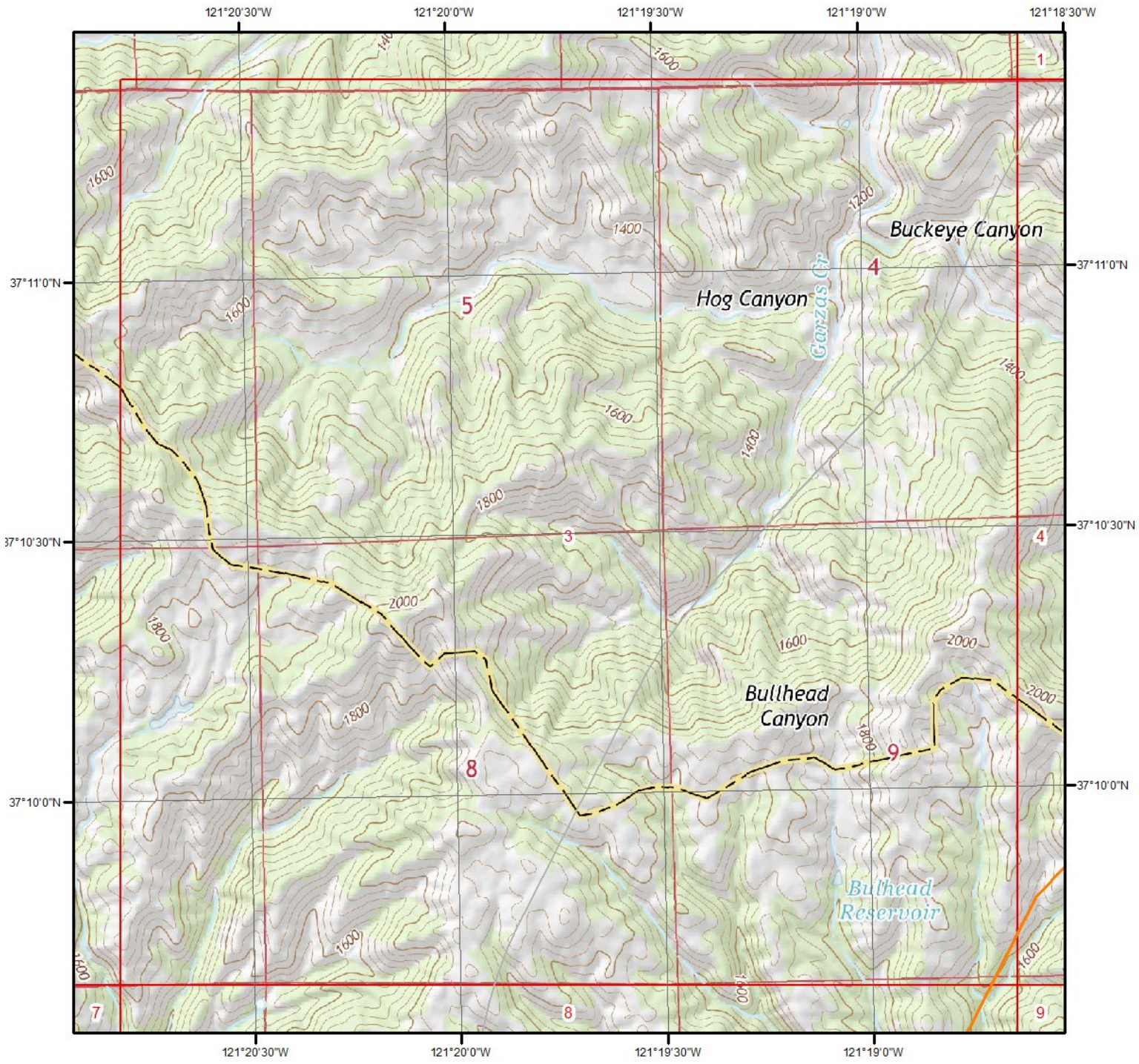
N

Quadrangle(s): Crevison Peak,CA; Mustang Peak,CA

Source: USGS 7.5 Minute Topographic Map

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Topographic Information



Current USGS Topo - Page 3

0 0.2 0.4 0.8 Miles

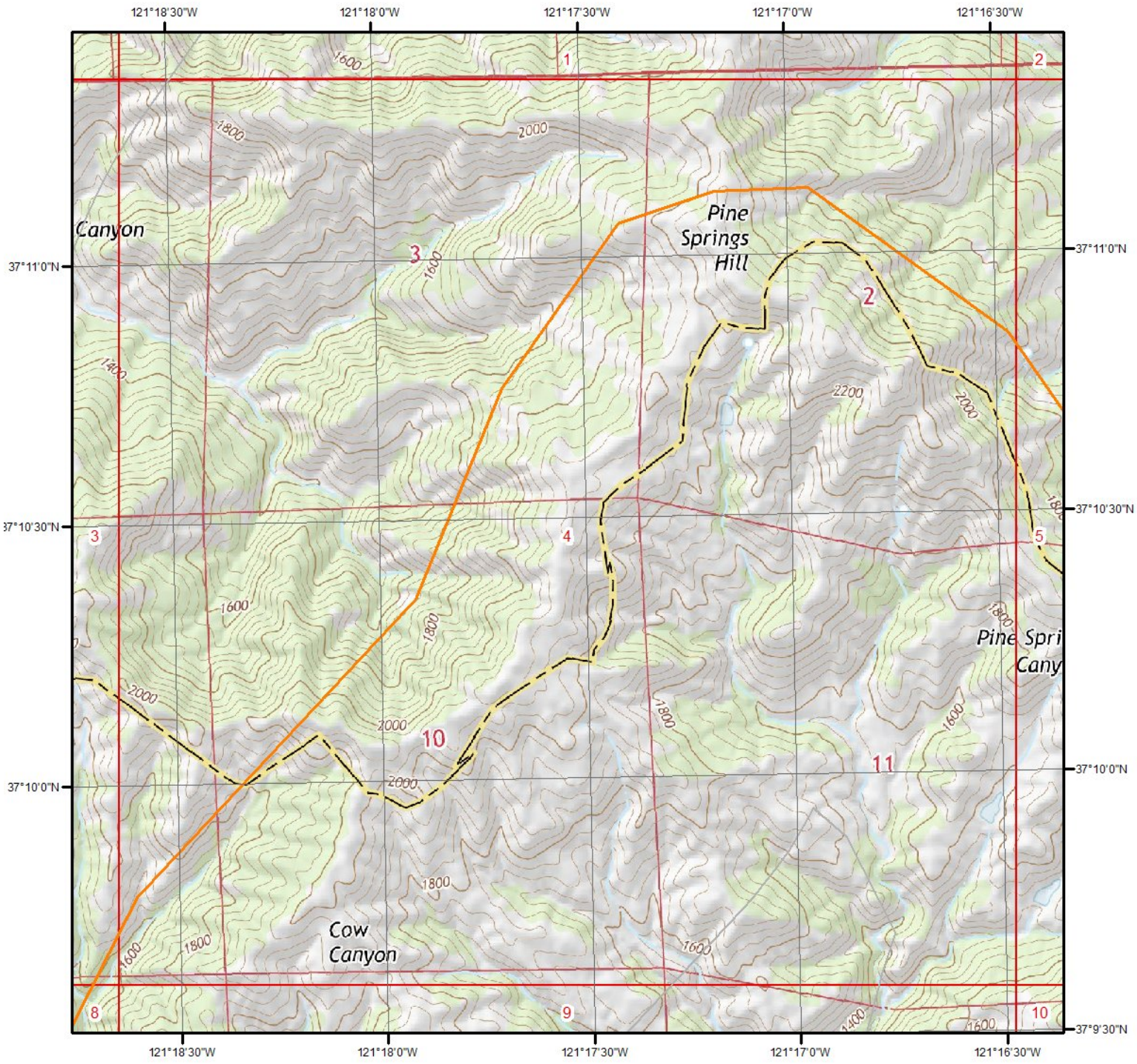
N

Quadrangle(s): Mustang Peak,CA

Source: USGS 7.5 Minute Topographic Map

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Topographic Information



Current USGS Topo - Page 4

0 0.2 0.4 0.8 Miles

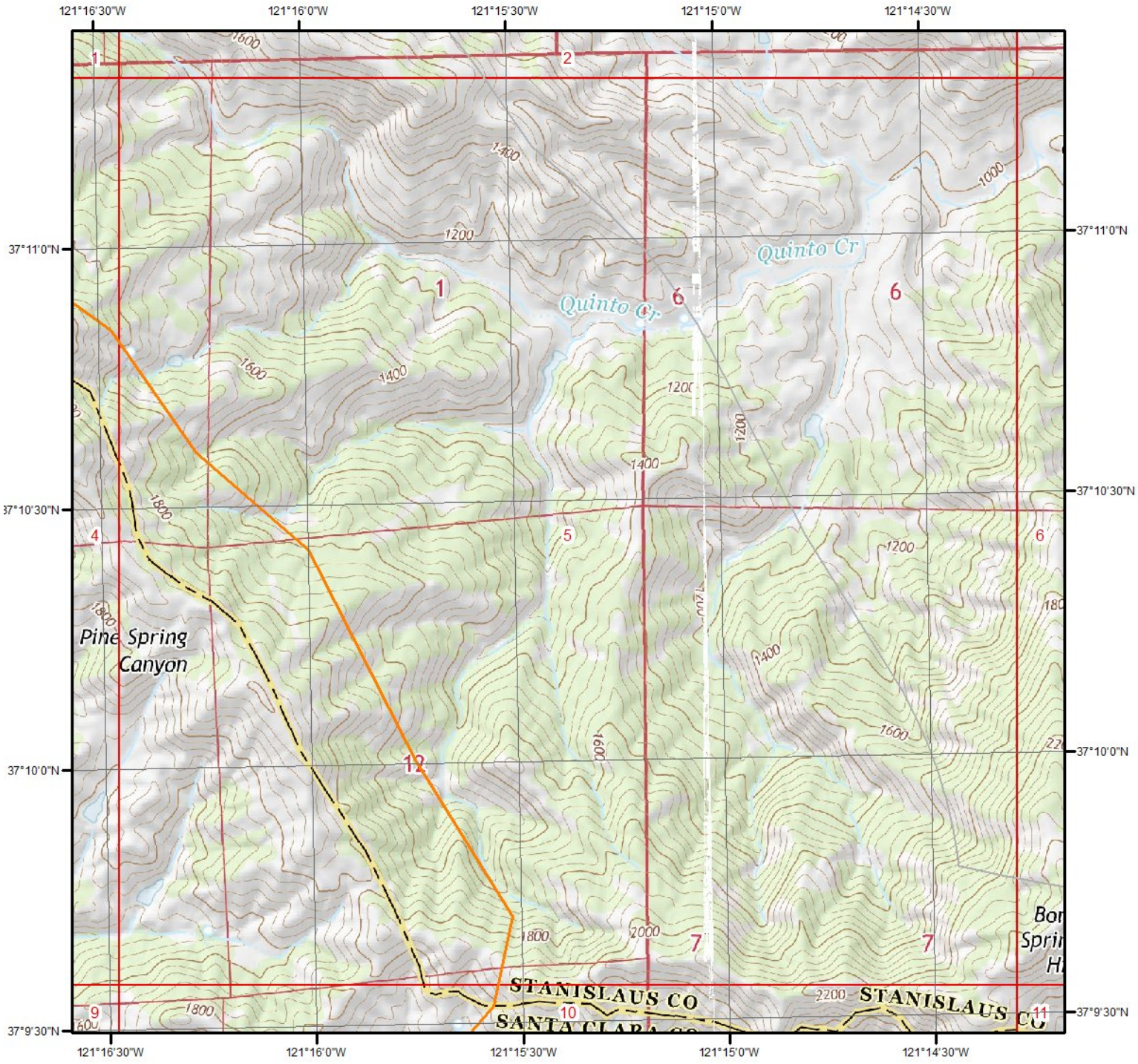
N

Quadrangle(s): Mustang Peak,CA

Source: USGS 7.5 Minute Topographic Map

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Topographic Information



Current USGS Topo - Page 5

0 0.2 0.4 0.8 Miles

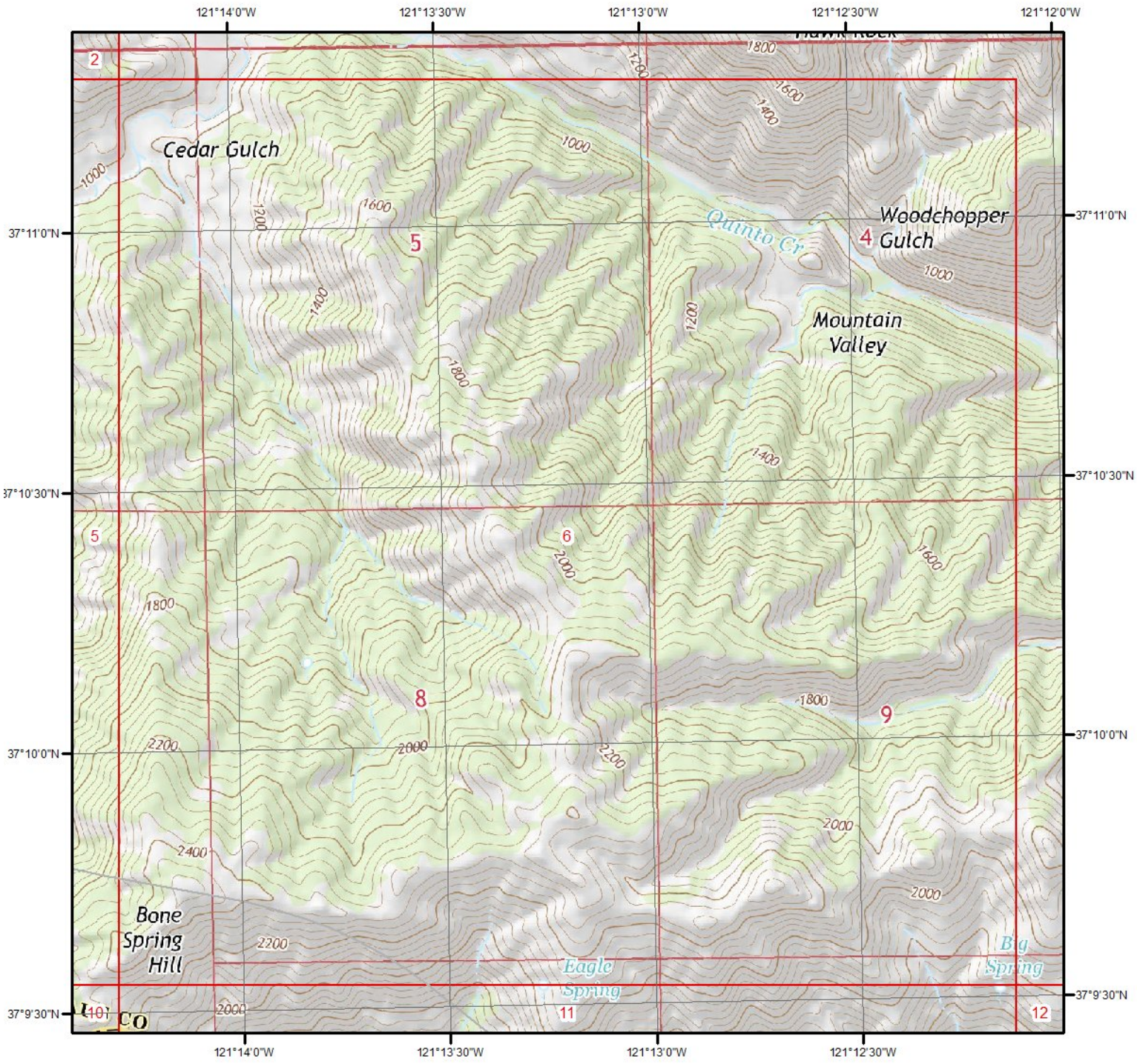
N

Quadrangle(s): Crevison Peak,CA; Mustang Peak,CA

Source: USGS 7.5 Minute Topographic Map

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Topographic Information



Current USGS Topo - Page 6

Miles
0 0.2 0.4 0.8

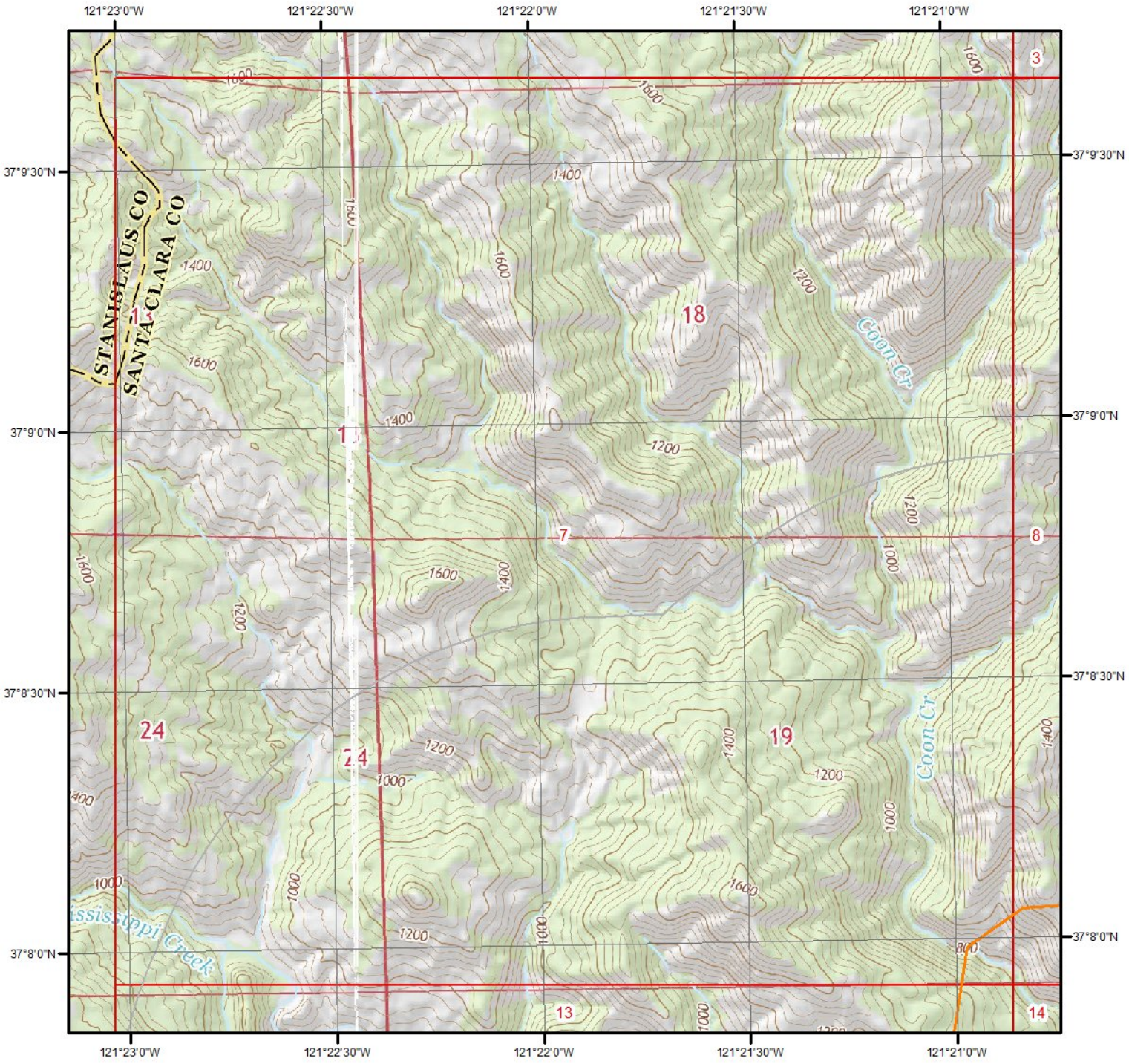
N

Quadrangle(s): Crevison Peak,CA

Source: USGS 7.5 Minute Topographic Map

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Topographic Information



Current USGS Topo - Page 7

0 0.2 0.4 0.8 Miles

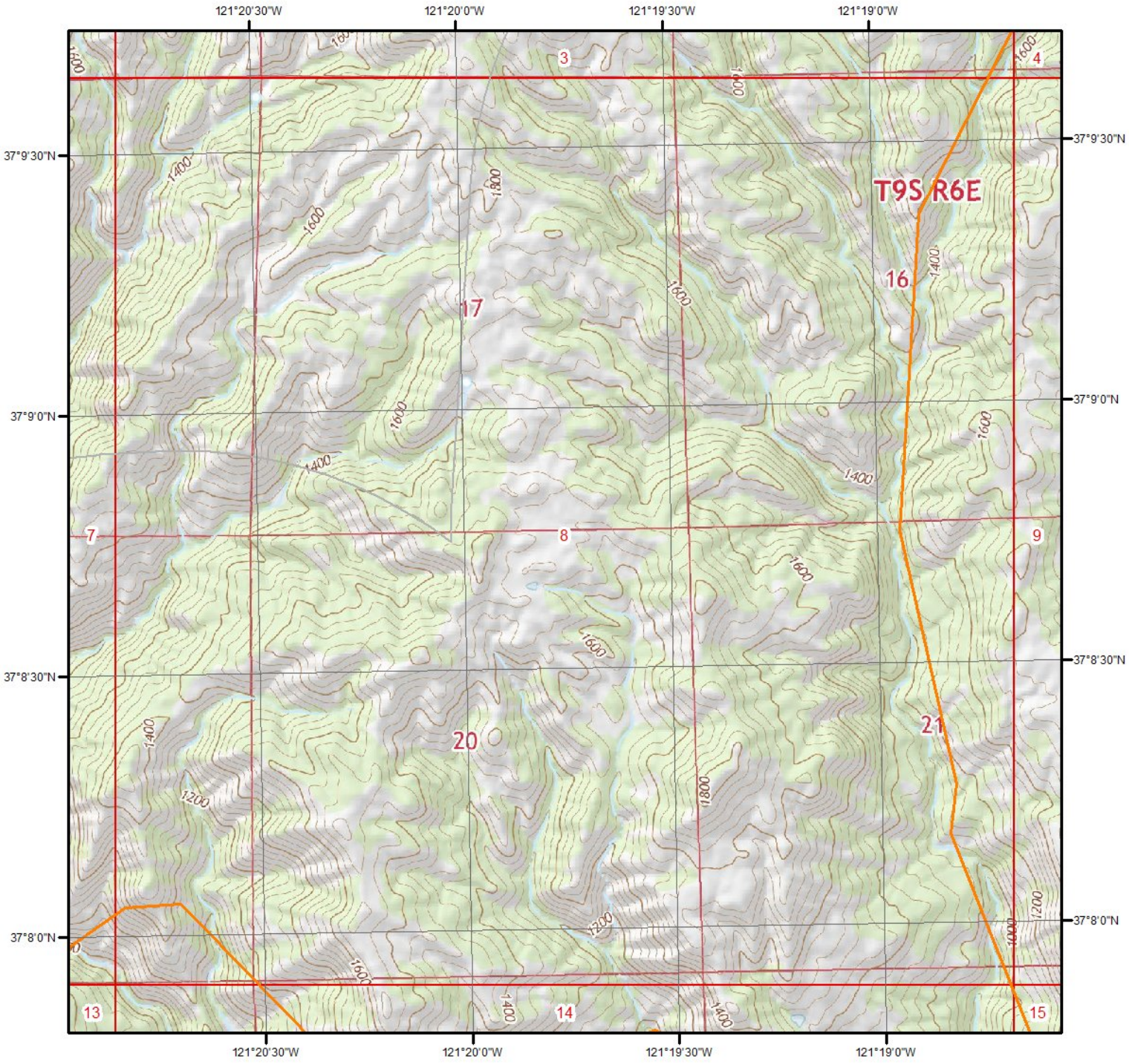
N

Quadrangle(s): Mississippi Creek,CA; Mustang Peak,CA

Source: USGS 7.5 Minute Topographic Map

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Topographic Information



Current USGS Topo - Page 8

0 0.2 0.4 0.8 Miles

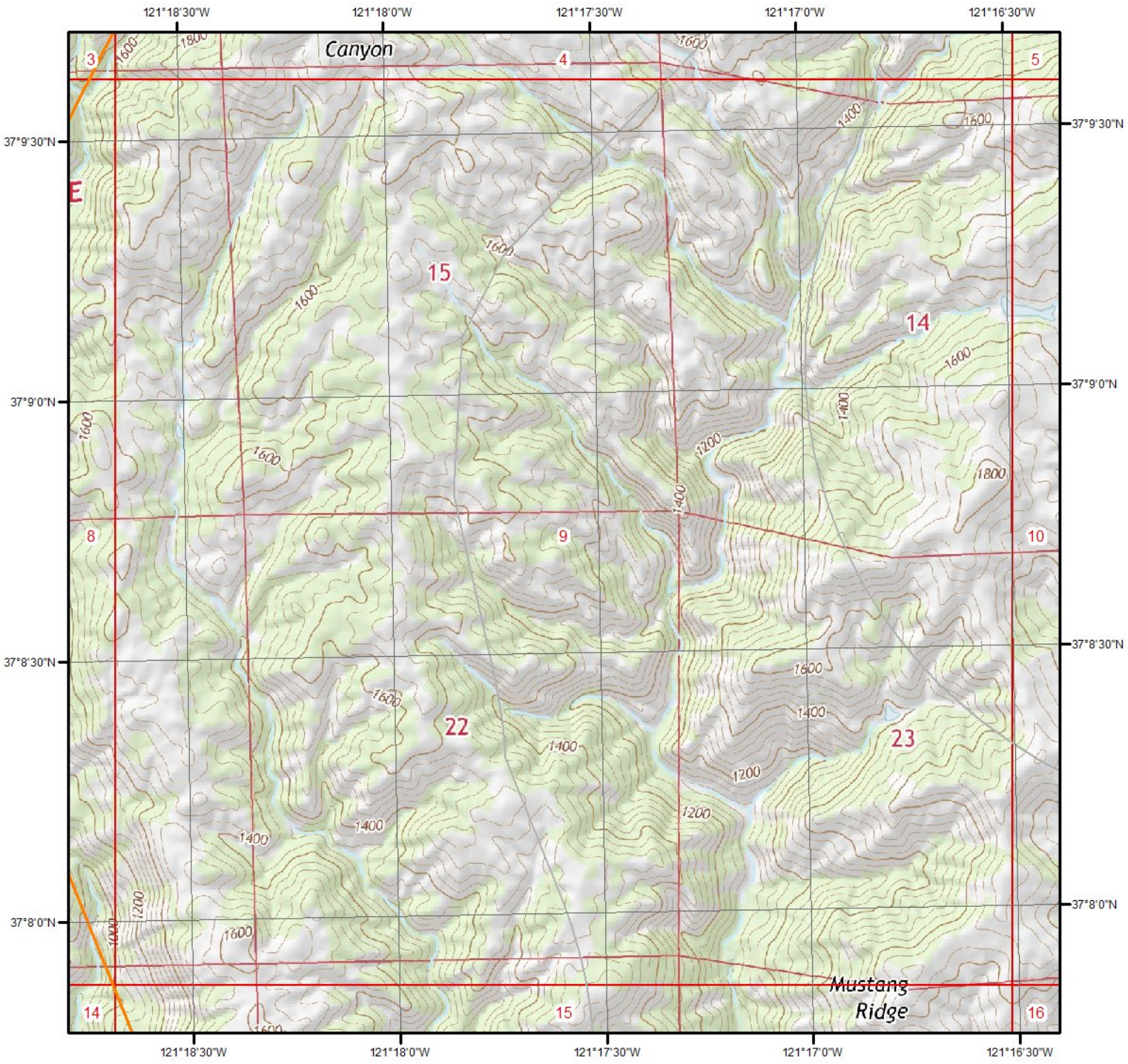
N

Quadrangle(s): Mustang Peak,CA

Source: USGS 7.5 Minute Topographic Map

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Topographic Information



Current USGS Topo - Page 9

0 0.2 0.4 0.8 Miles

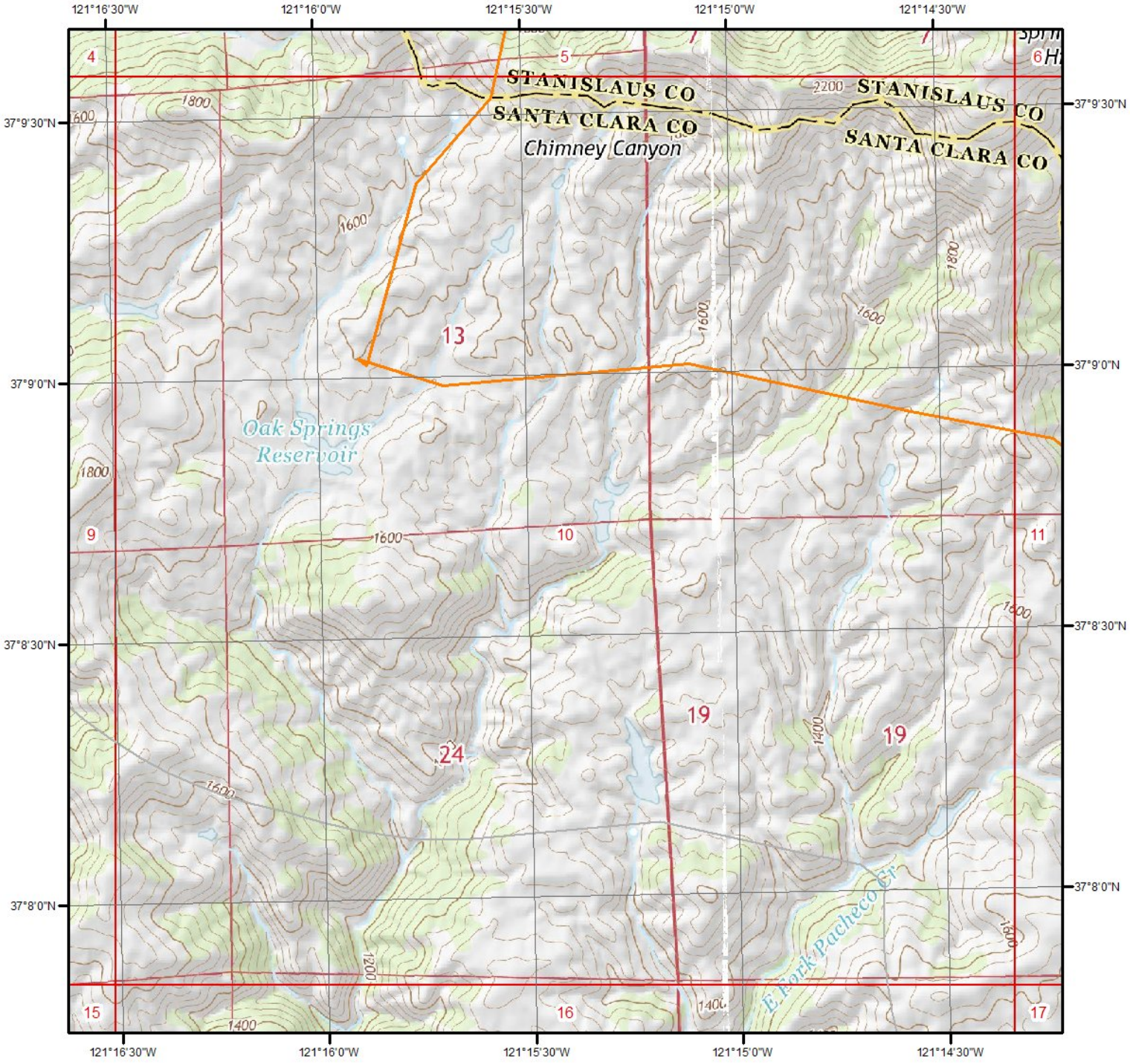
N

Quadrangle(s): Mustang Peak,CA

Source: USGS 7.5 Minute Topographic Map

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Topographic Information



Current USGS Topo - Page 10

0 0.2 0.4 0.8 Miles

N

Quadrangle(s): Crevison Peak,CA; Mustang Peak,CA

Source: USGS 7.5 Minute Topographic Map

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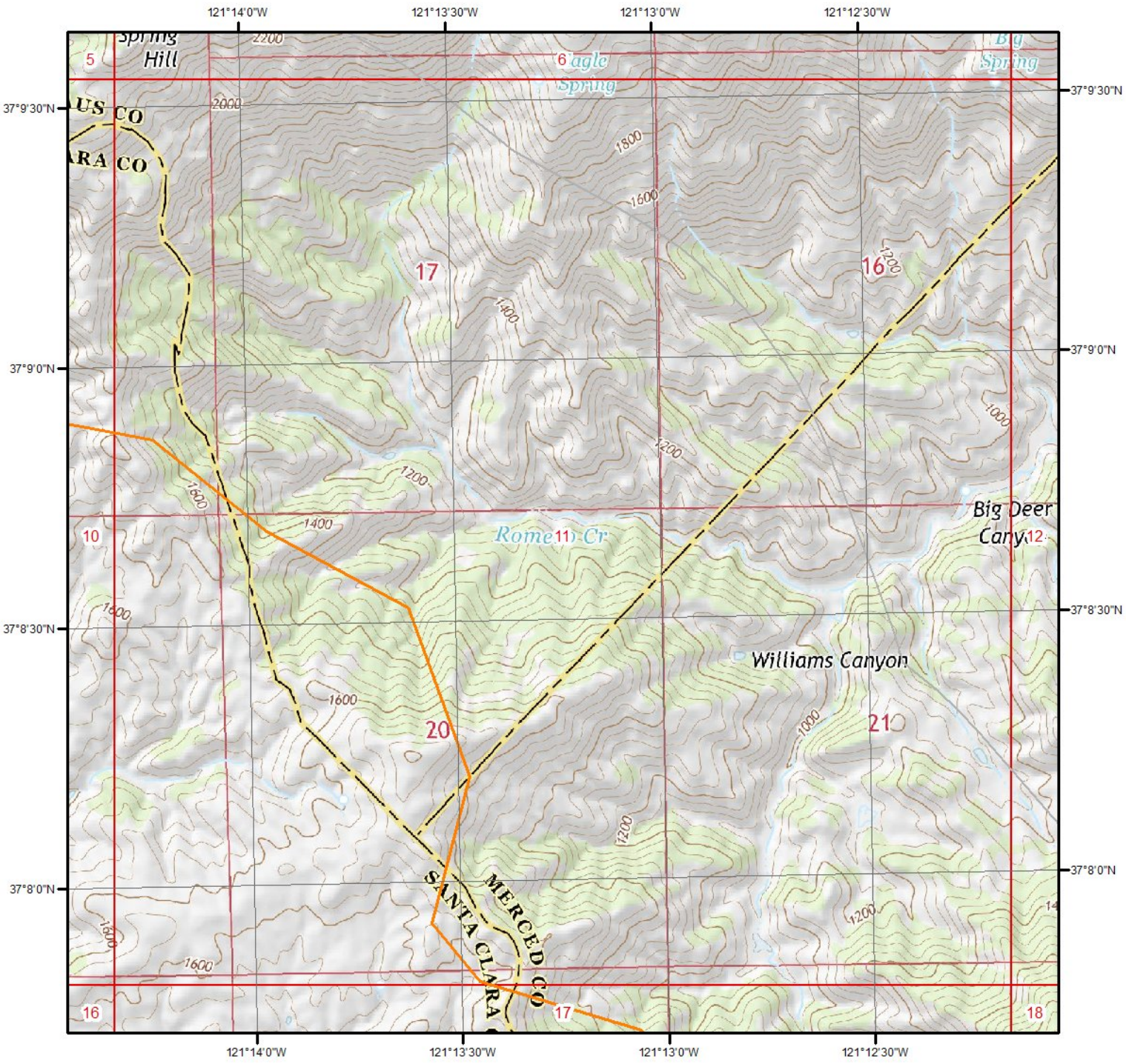
ENVIRONMENTAL RISK INFORMATION SERVICES

Topographic Information



Current USGS Topo - Page 11

0 0.2 0.4 0.8 Miles

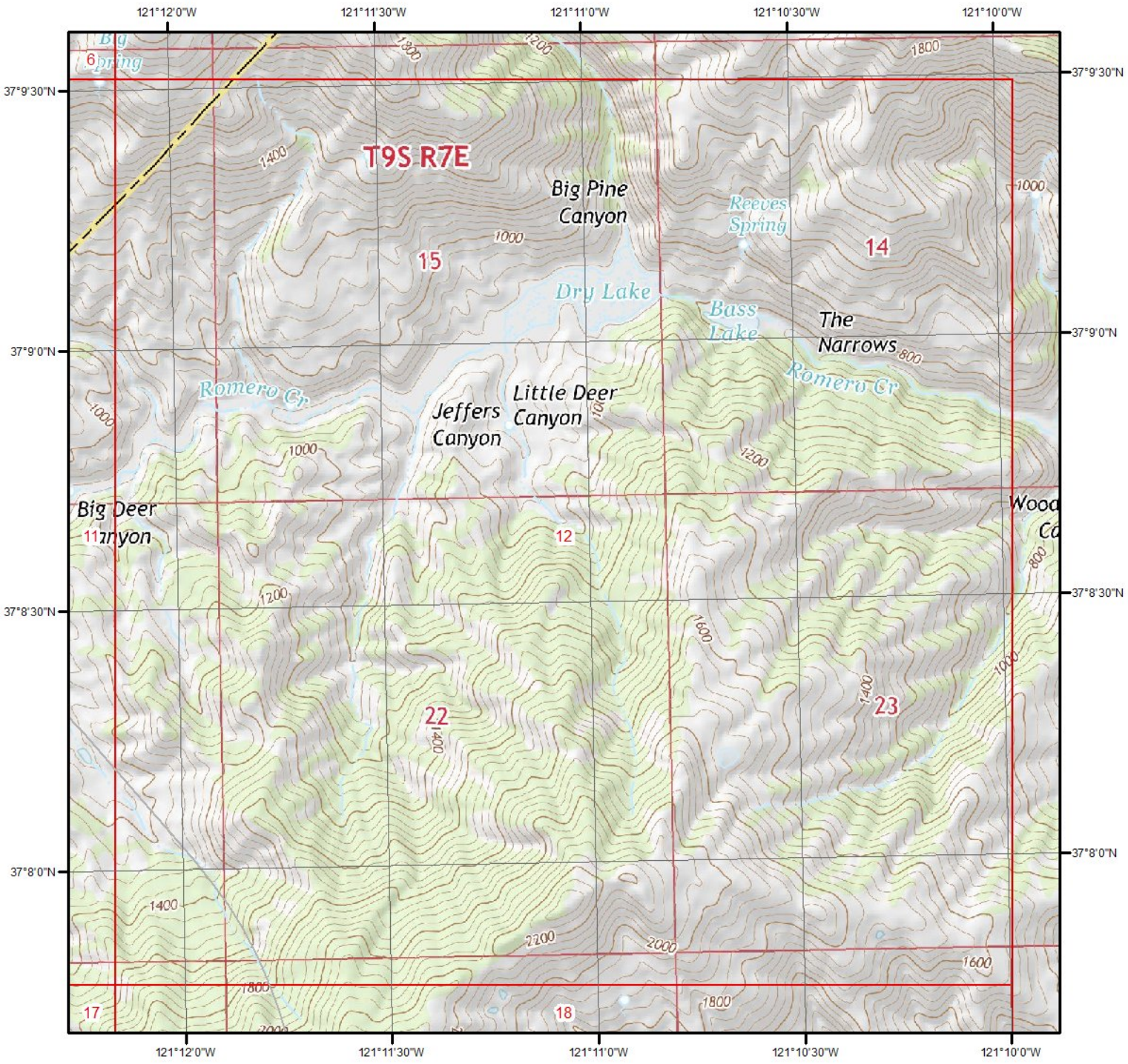
N

Quadrangle(s): Crevison Peak,CA

Source: USGS 7.5 Minute Topographic Map

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Topographic Information



Current USGS Topo - Page 12

0 0.2 0.4 0.8 Miles

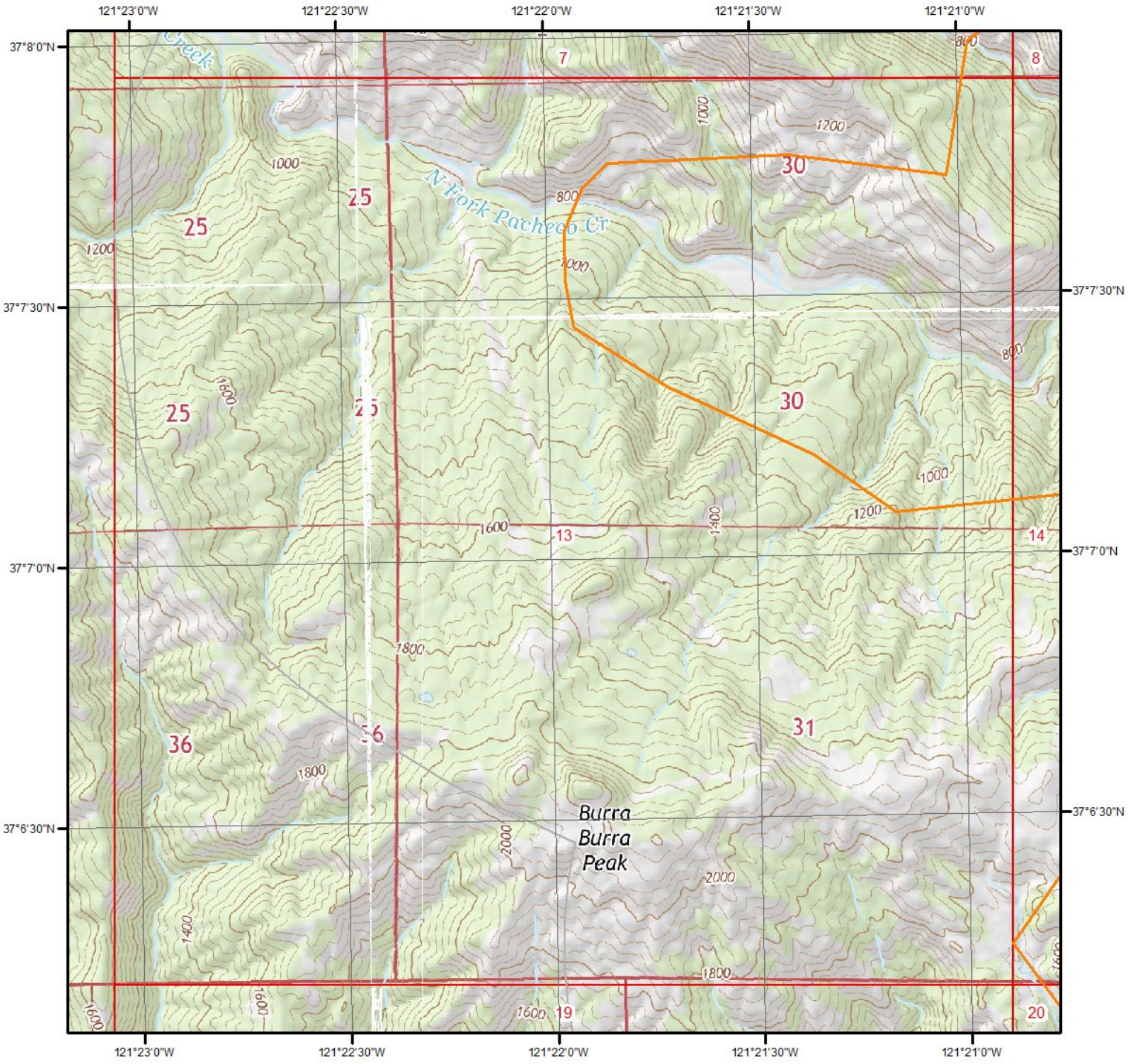
N

Quadrangle(s): Crevison Peak,CA

Source: USGS 7.5 Minute Topographic Map

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Topographic Information



Current USGS Topo - Page 13

0 0.2 0.4 0.8 Miles

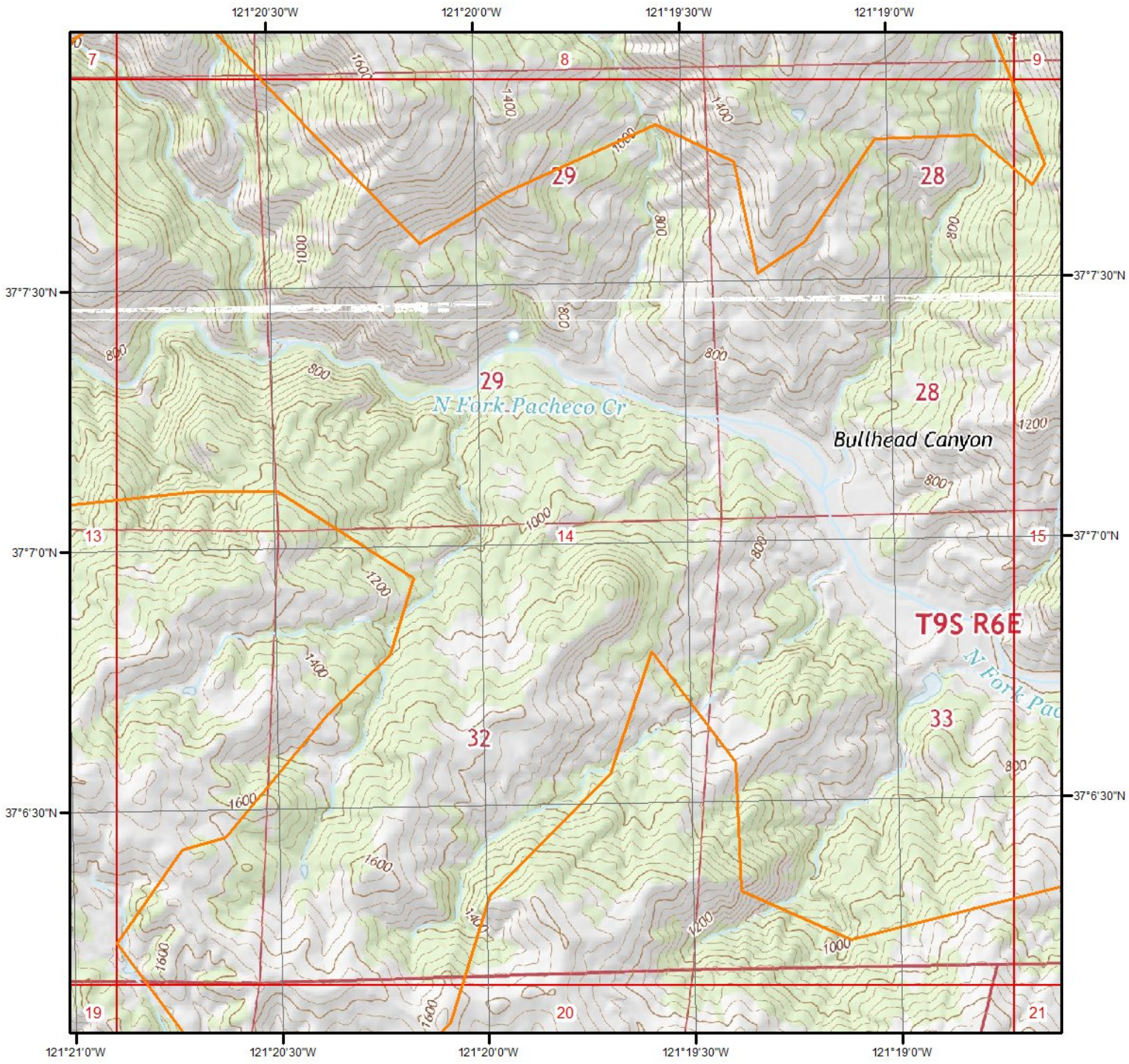
N

Quadrangle(s): Gilroy Hot Springs,CA; Mississippi Creek,CA; Mustang Peak,CA; Pacheco Peak,CA

Source: USGS 7.5 Minute Topographic Map

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Topographic Information



Current USGS Topo - Page 14

0 0.2 0.4 0.8 Miles

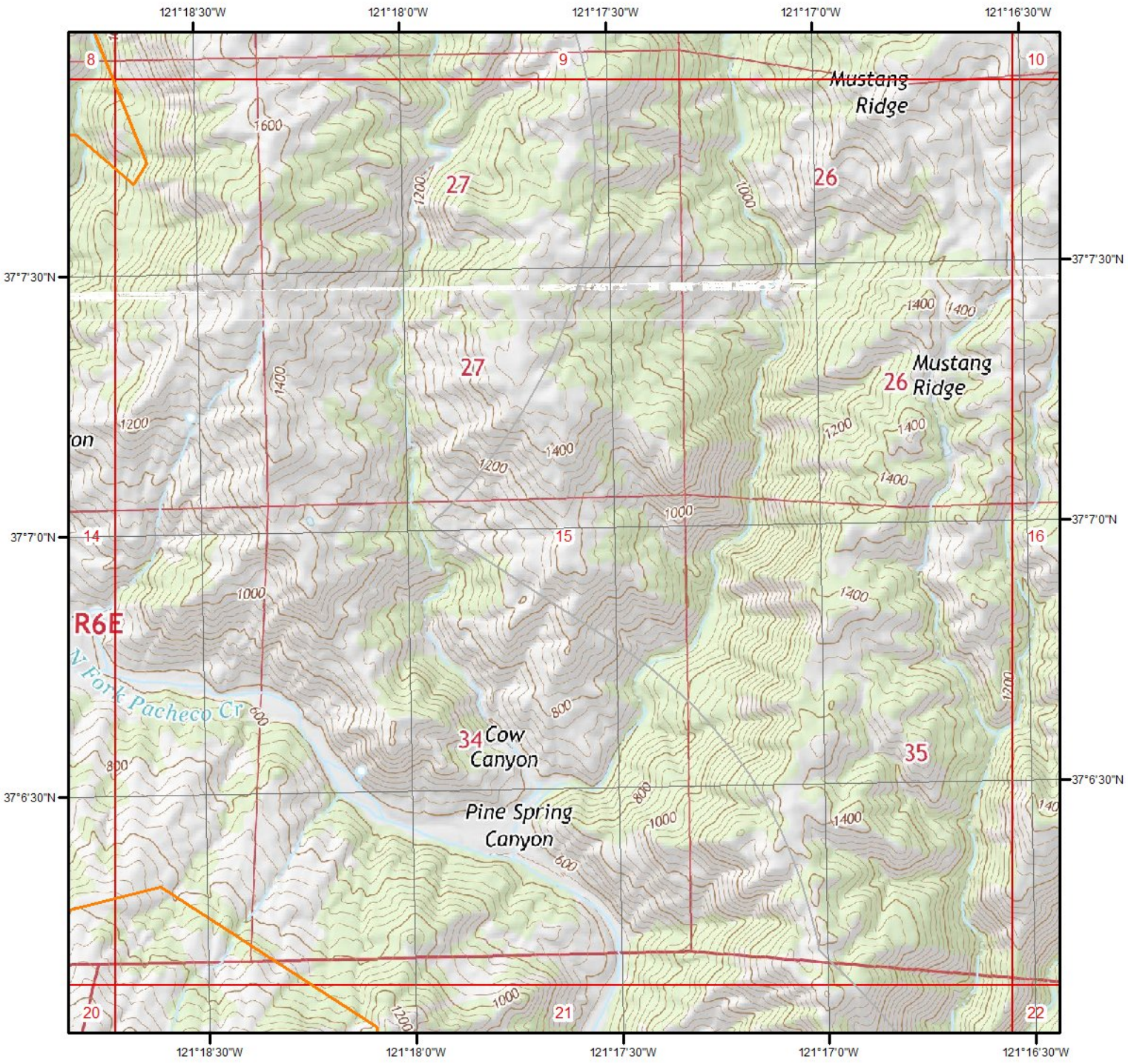
N

Quadrangle(s): Mustang Peak,CA; Pacheco Peak,CA

Source: USGS 7.5 Minute Topographic Map

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Topographic Information



Current USGS Topo - Page 15

0 0.2 0.4 0.8 Miles

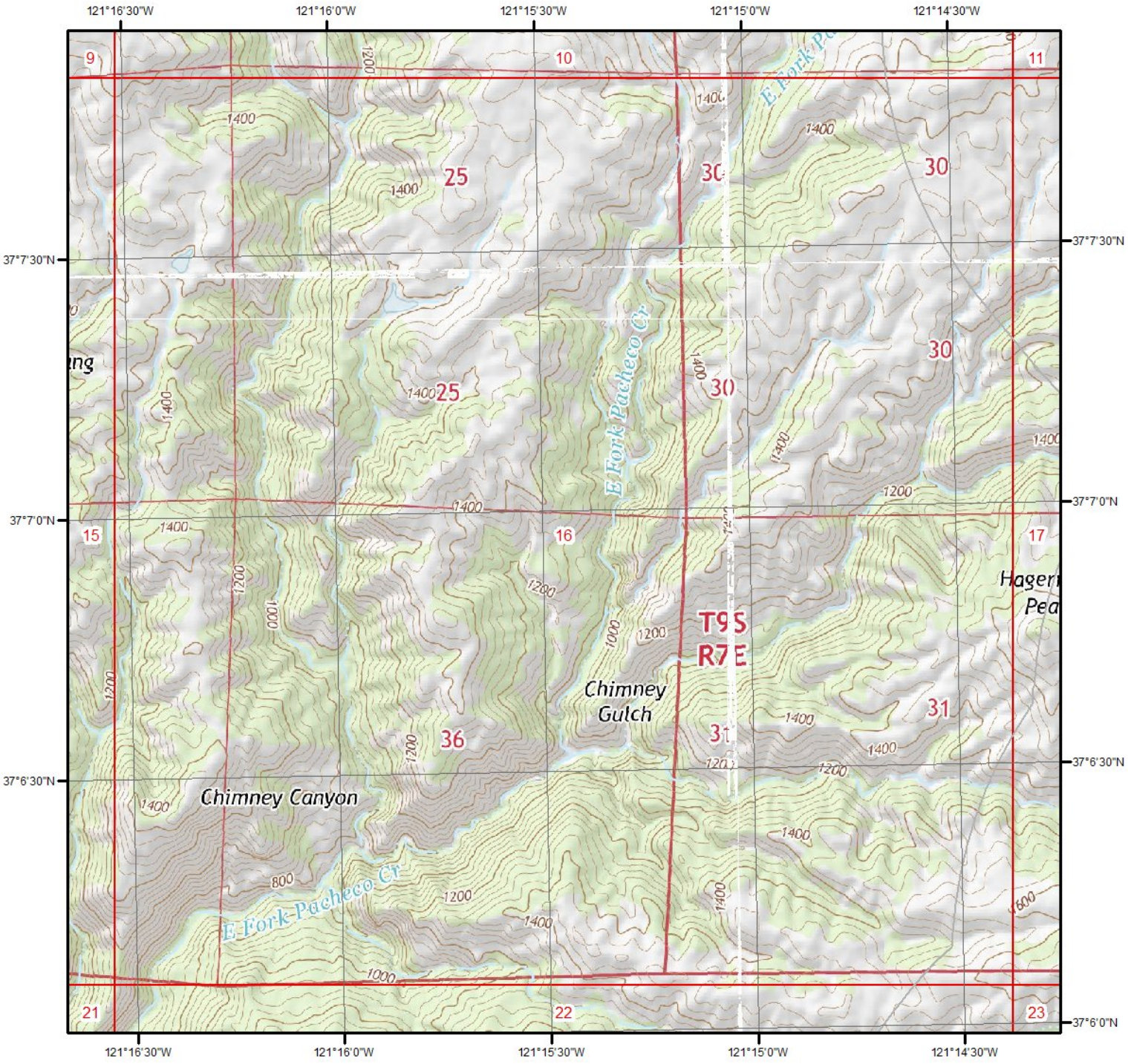
N

Quadrangle(s): Mustang Peak,CA; Pacheco Peak,CA

Source: USGS 7.5 Minute Topographic Map

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Topographic Information



Current USGS Topo - Page 16

0 0.2 0.4 0.8 Miles

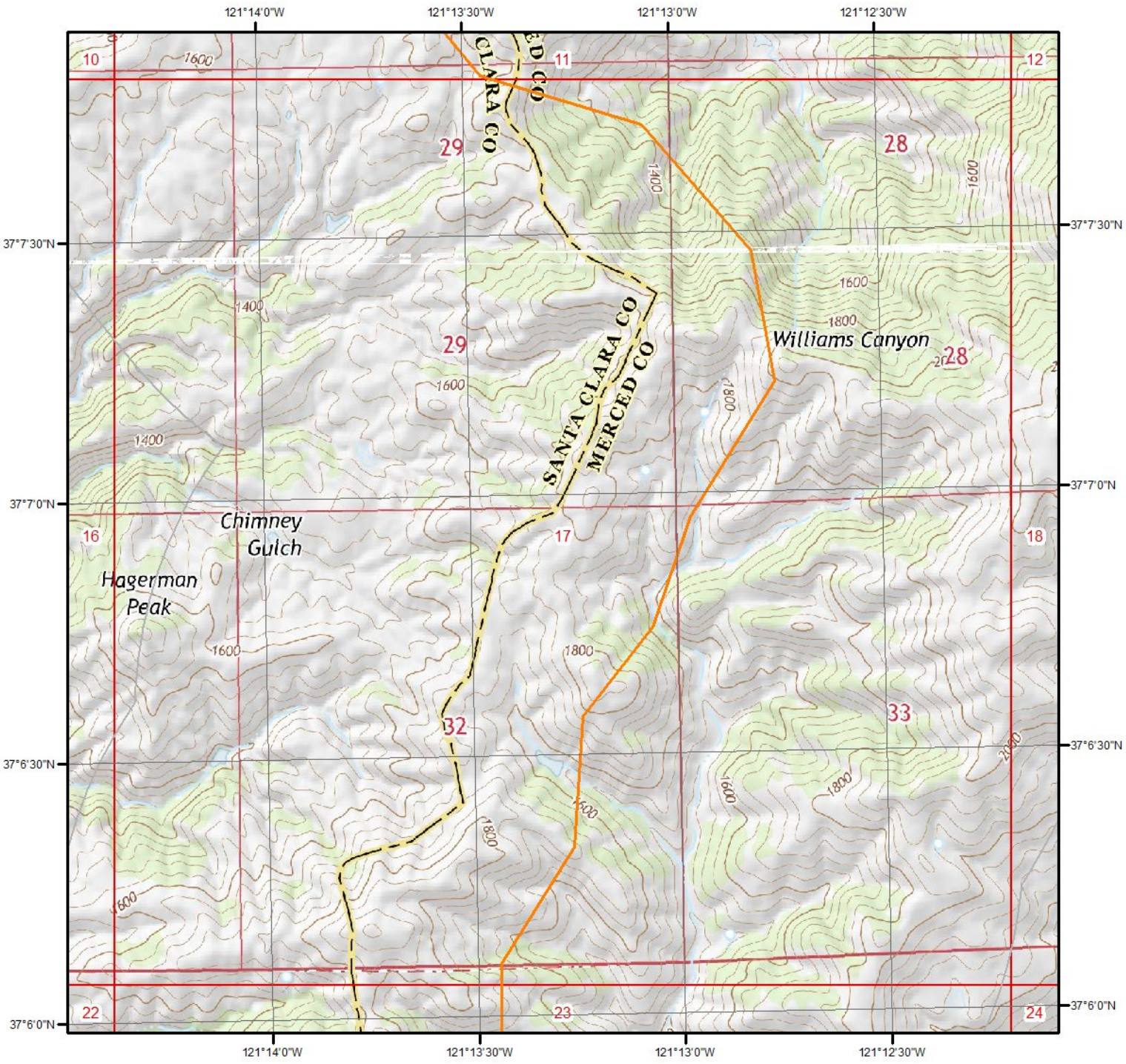
N

Quadrangle(s): Crevison Peak,CA; Mustang Peak,CA; Pacheco Pass,CA; Pacheco Peak,CA

Source: USGS 7.5 Minute Topographic Map

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Topographic Information



Current USGS Topo - Page 17

0 0.2 0.4 0.8 Miles

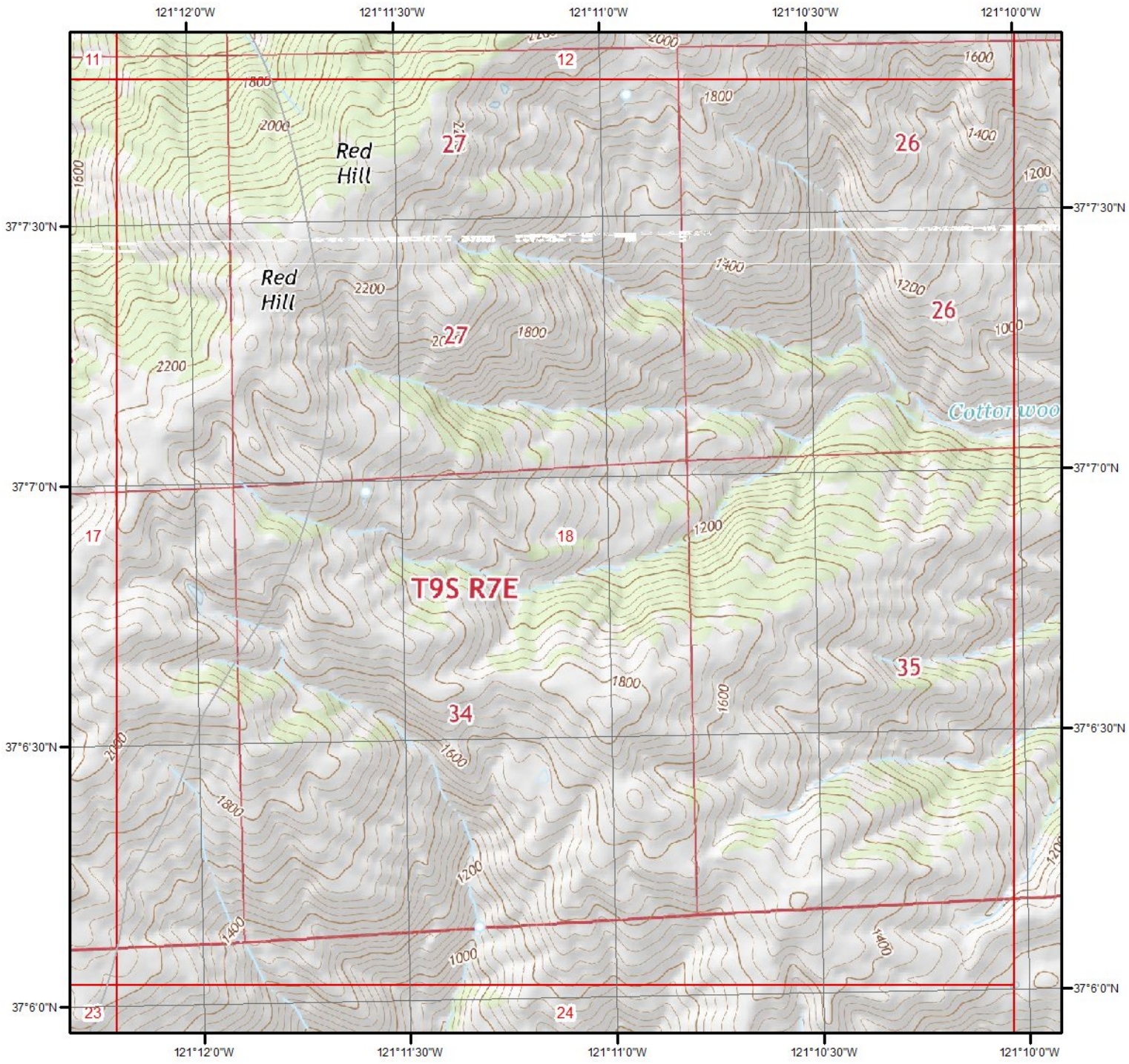
N

Quadrangle(s): Crevison Peak,CA; Pacheco Pass,CA

Source: USGS 7.5 Minute Topographic Map

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Topographic Information



Current USGS Topo - Page 18

0 0.2 0.4 0.8 Miles

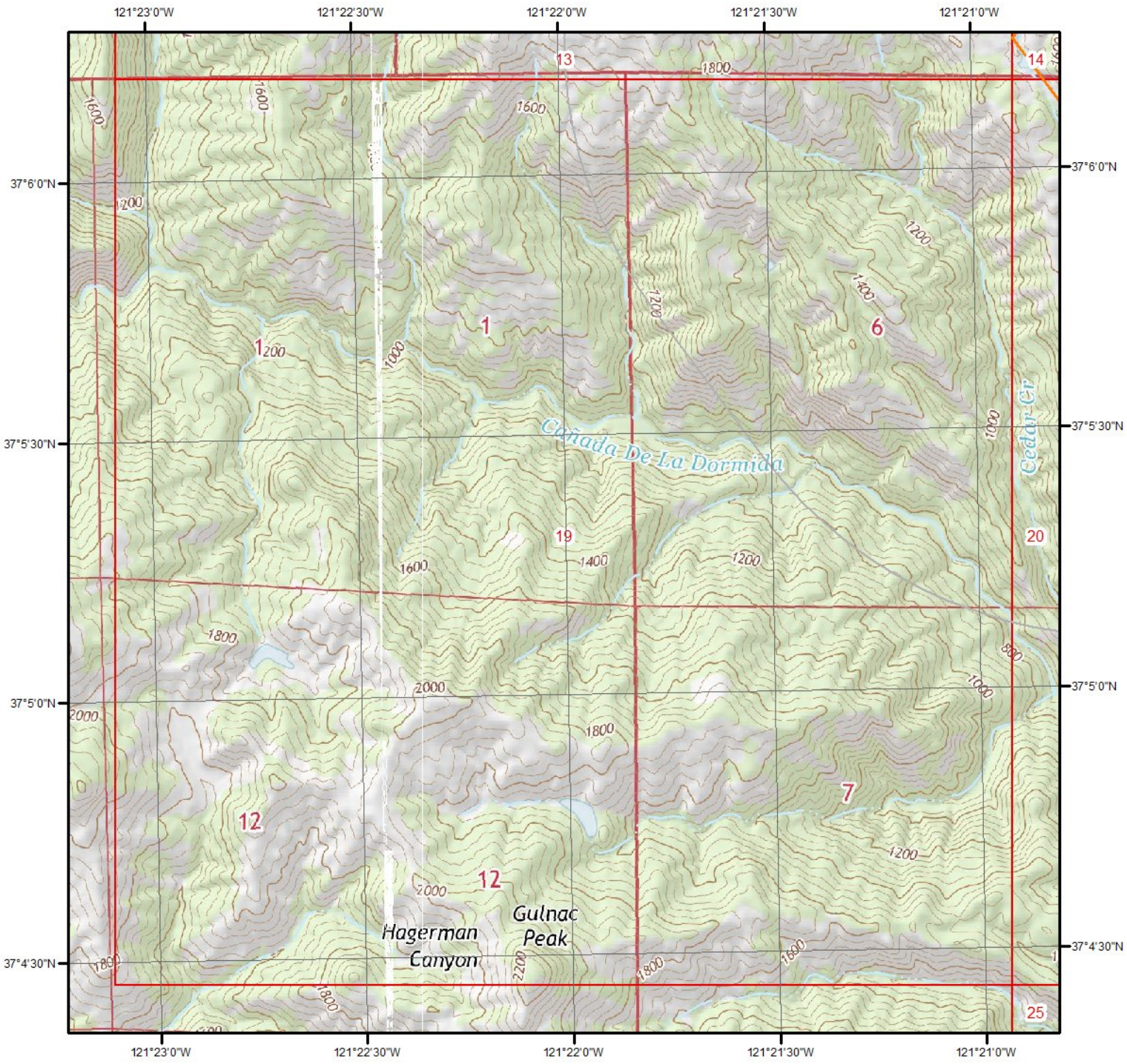
N

Quadrangle(s): Crevison Peak,CA; Pacheco Pass,CA

Source: USGS 7.5 Minute Topographic Map

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Topographic Information



Current USGS Topo - Page 19

0 0.2 0.4 0.8 Miles

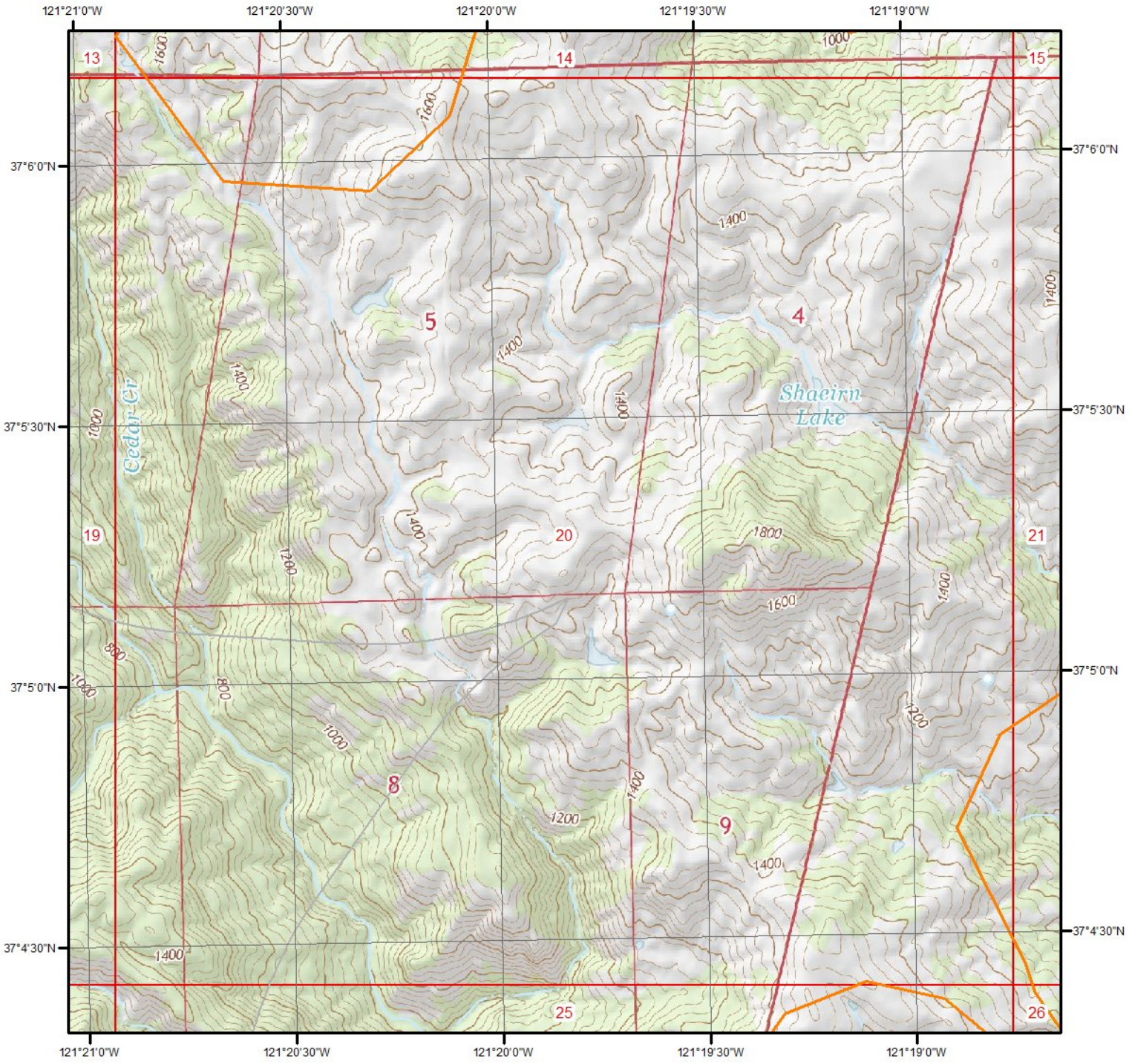
N

Quadrangle(s): Gilroy Hot Springs,CA; Pacheco Peak,CA

Source: USGS 7.5 Minute Topographic Map

ERIS ENVIRONMENTAL RISK INFORMATION SERVICES

Topographic Information



Current USGS Topo - Page 20

Miles
0 0.2 0.4 0.8

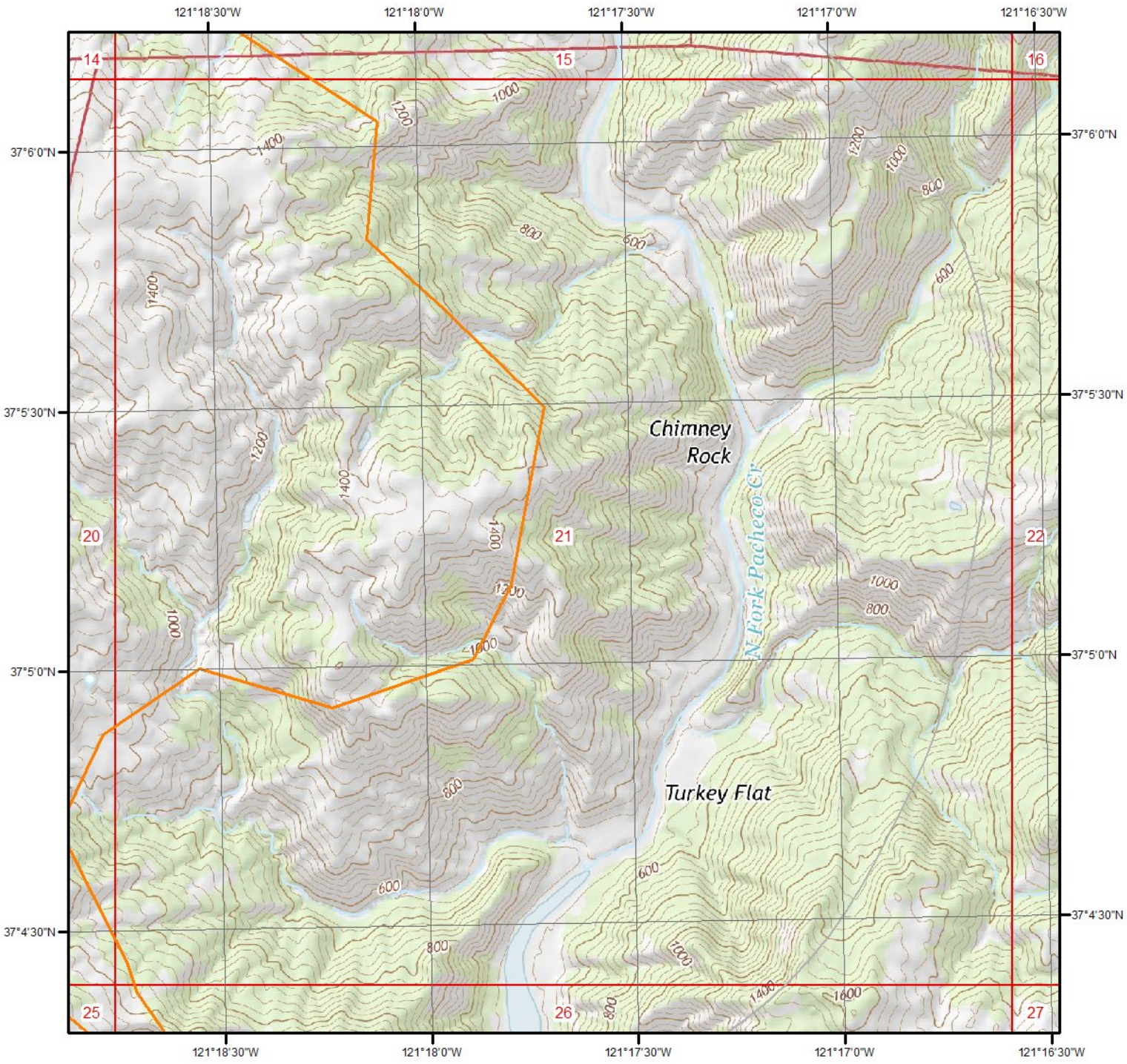
N

Quadrangle(s): Pacheco Peak,CA

Source: USGS 7.5 Minute Topographic Map

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Topographic Information



Current USGS Topo - Page 21

0 0.2 0.4 0.8 Miles

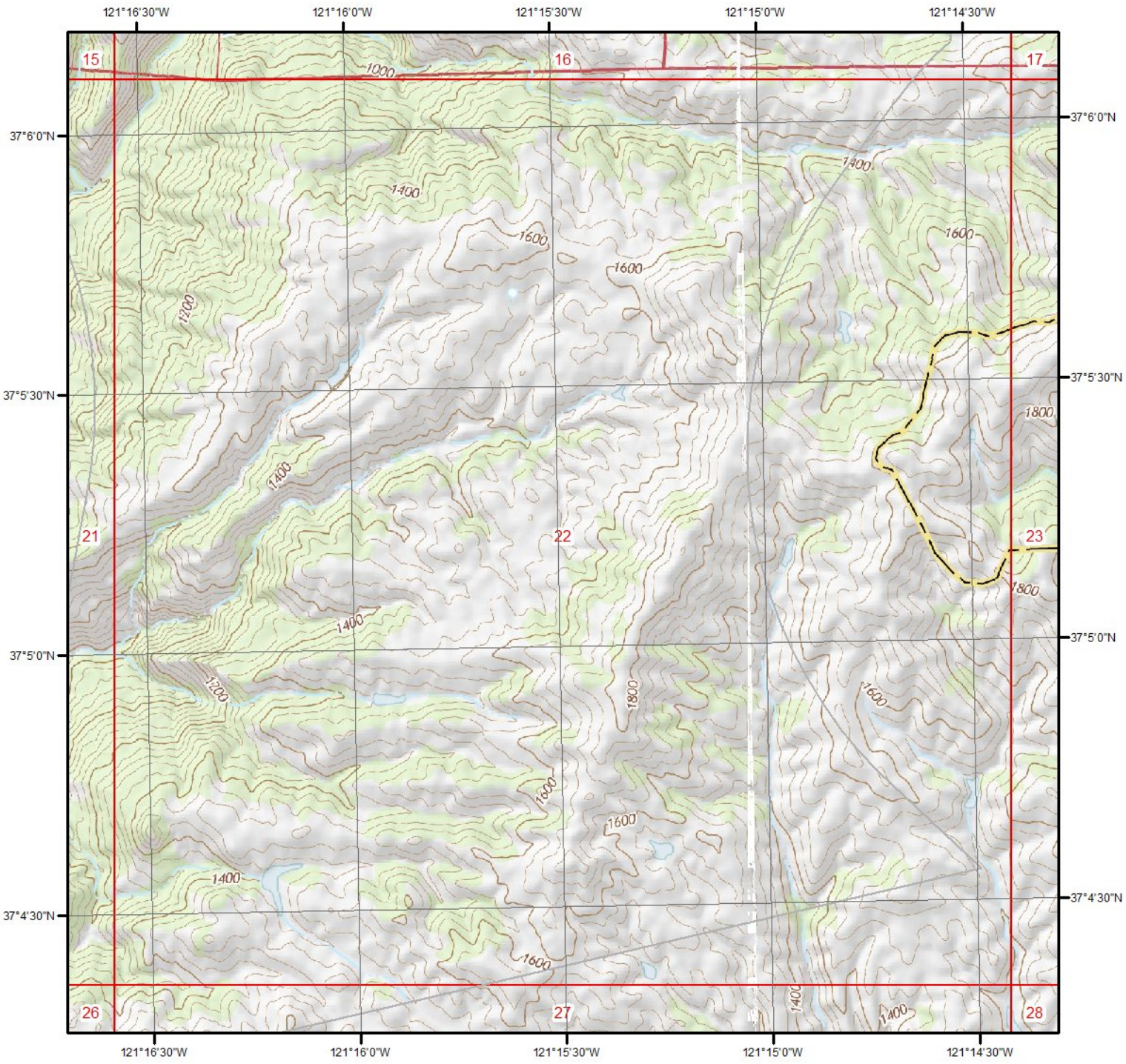
N

Quadrangle(s): Pacheco Peak,CA

Source: USGS 7.5 Minute Topographic Map

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Topographic Information



Current USGS Topo - Page 22

0 0.2 0.4 0.8 Miles

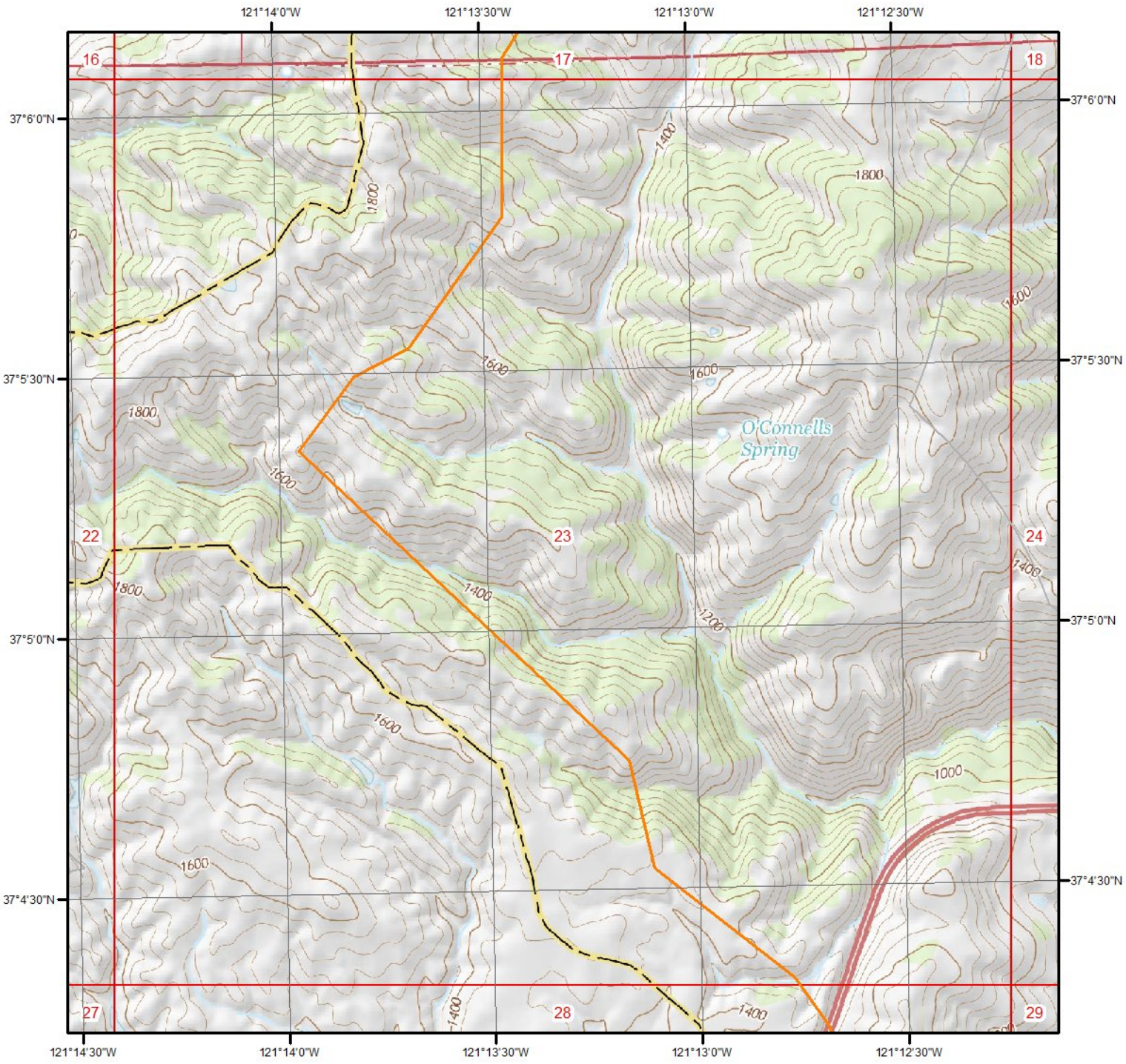
N

Quadrangle(s): Pacheco Pass,CA; Pacheco Peak,CA

Source: USGS 7.5 Minute Topographic Map

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Topographic Information



Current USGS Topo - Page 23

0 0.2 0.4 0.8 Miles

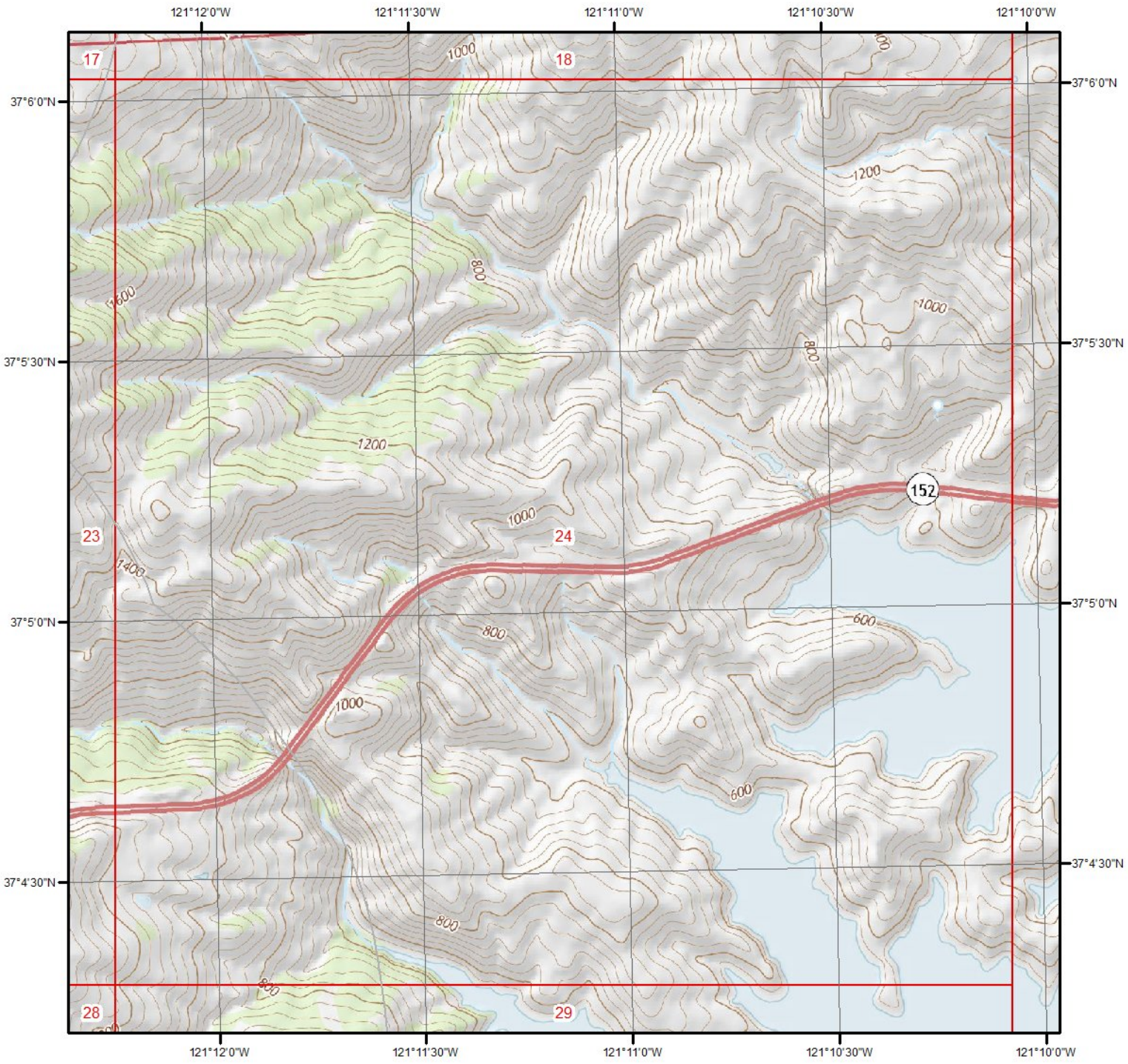
N

Quadrangle(s): Pacheco Pass,CA

Source: USGS 7.5 Minute Topographic Map

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Topographic Information



Current USGS Topo - Page 24

0 0.2 0.4 0.8 Miles

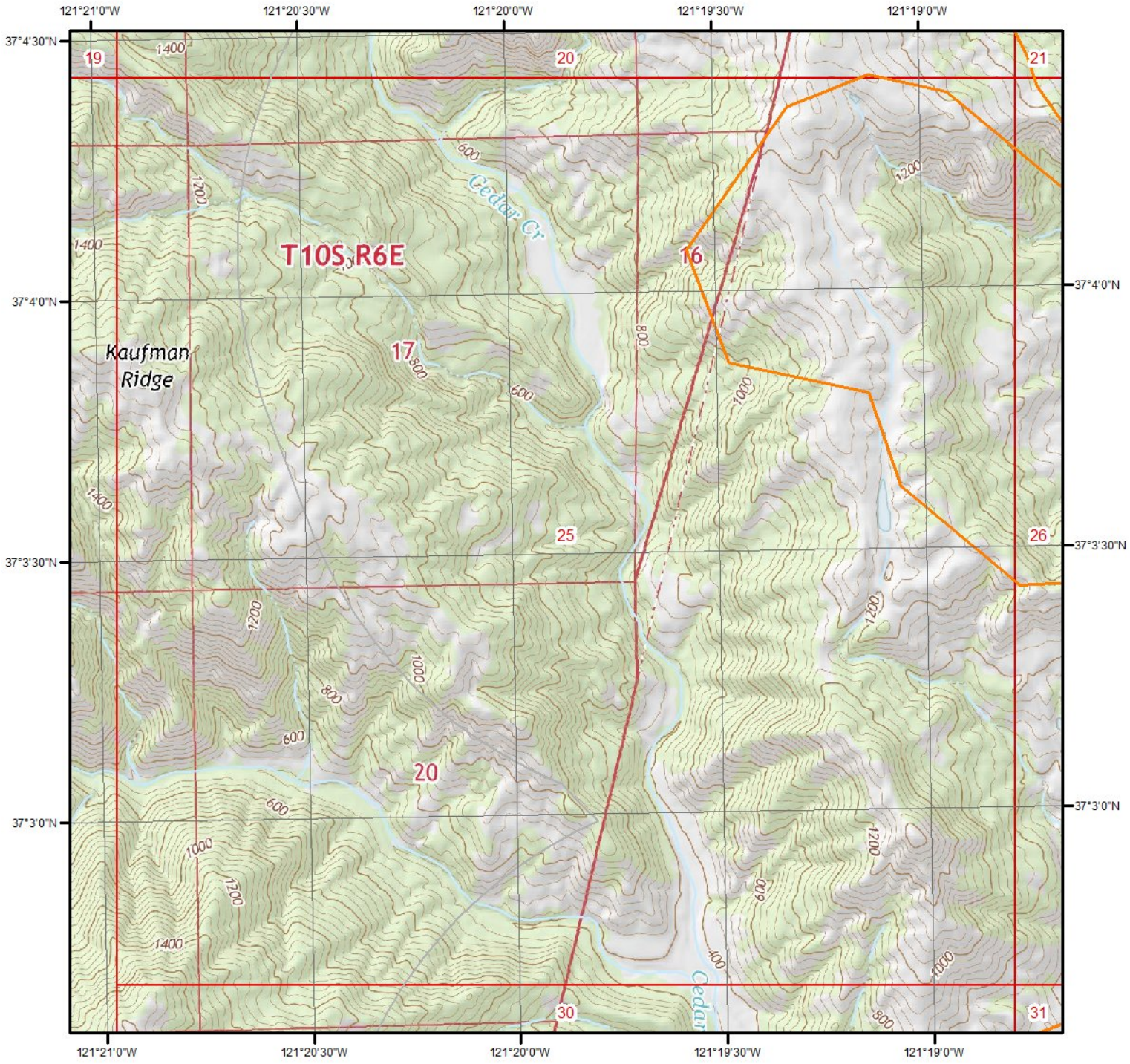
N

Quadrangle(s): Pacheco Pass,CA

Source: USGS 7.5 Minute Topographic Map

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Topographic Information



Current USGS Topo - Page 25

0 0.2 0.4 0.8 Miles

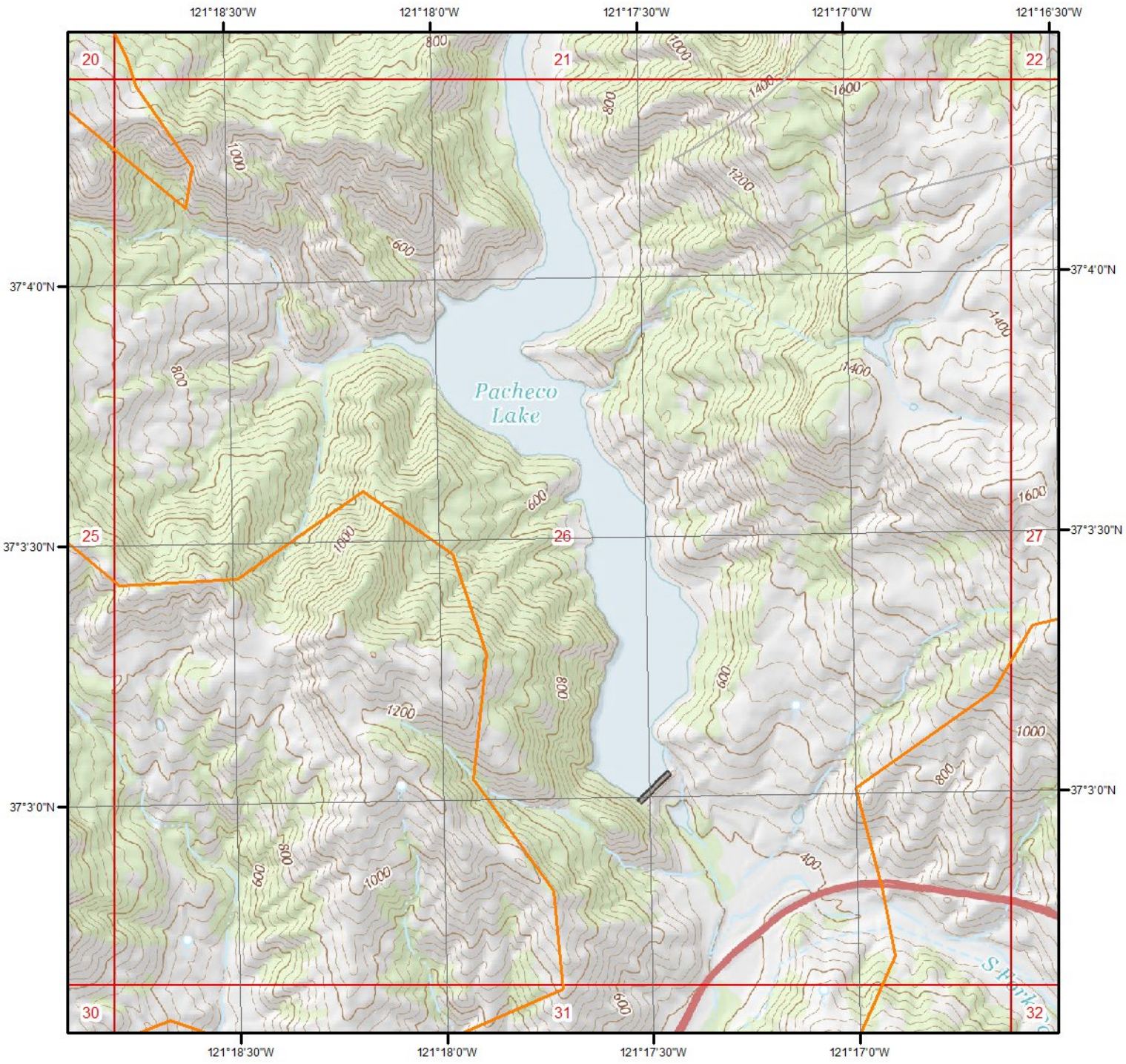
N

Quadrangle(s): Pacheco Peak,CA

Source: USGS 7.5 Minute Topographic Map

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Topographic Information



Current USGS Topo - Page 26

0 0.2 0.4 0.8 Miles

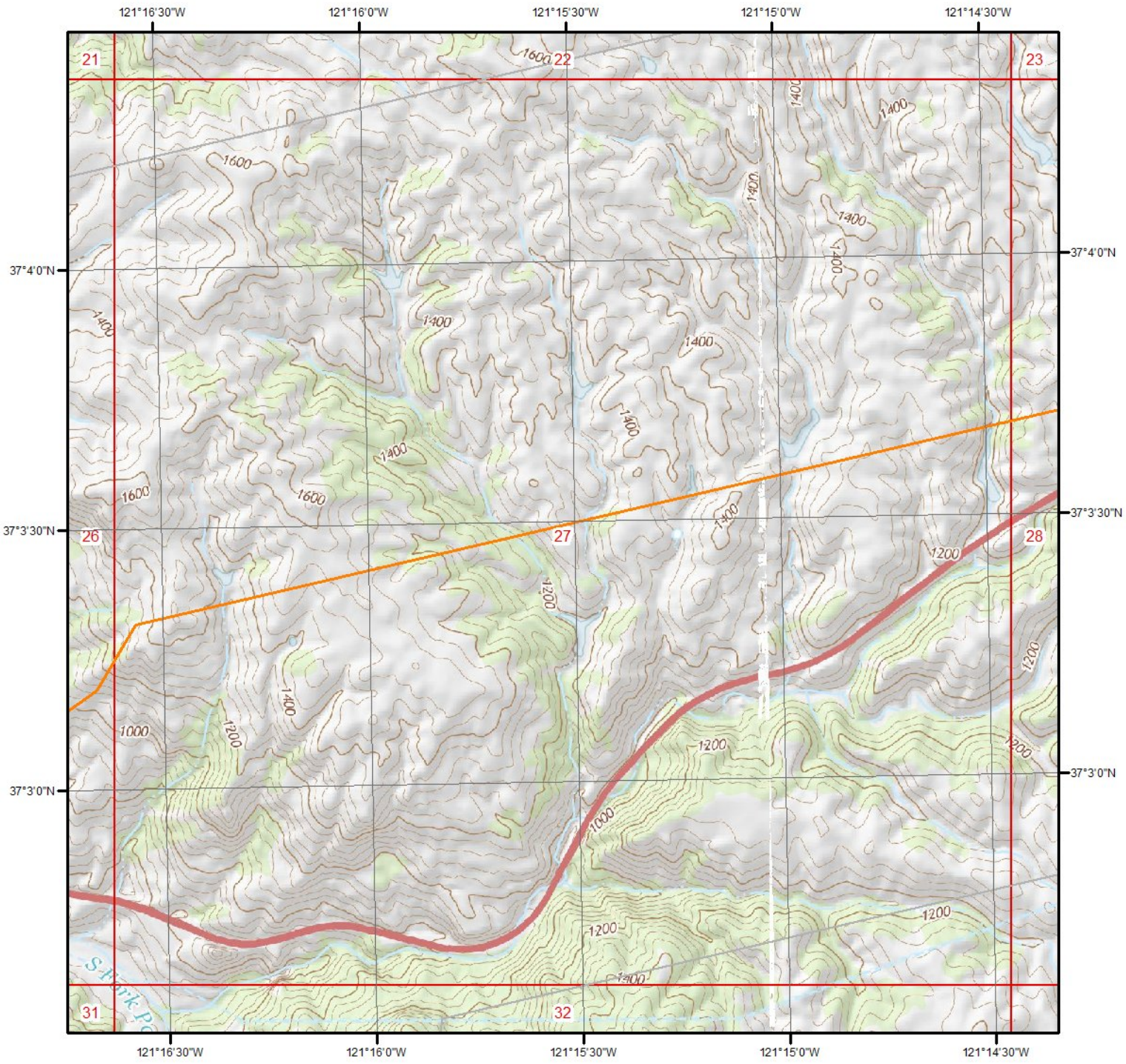
N

Quadrangle(s): Pacheco Peak,CA

Source: USGS 7.5 Minute Topographic Map

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Topographic Information



Current USGS Topo - Page 27

0 0.2 0.4 0.8 Miles

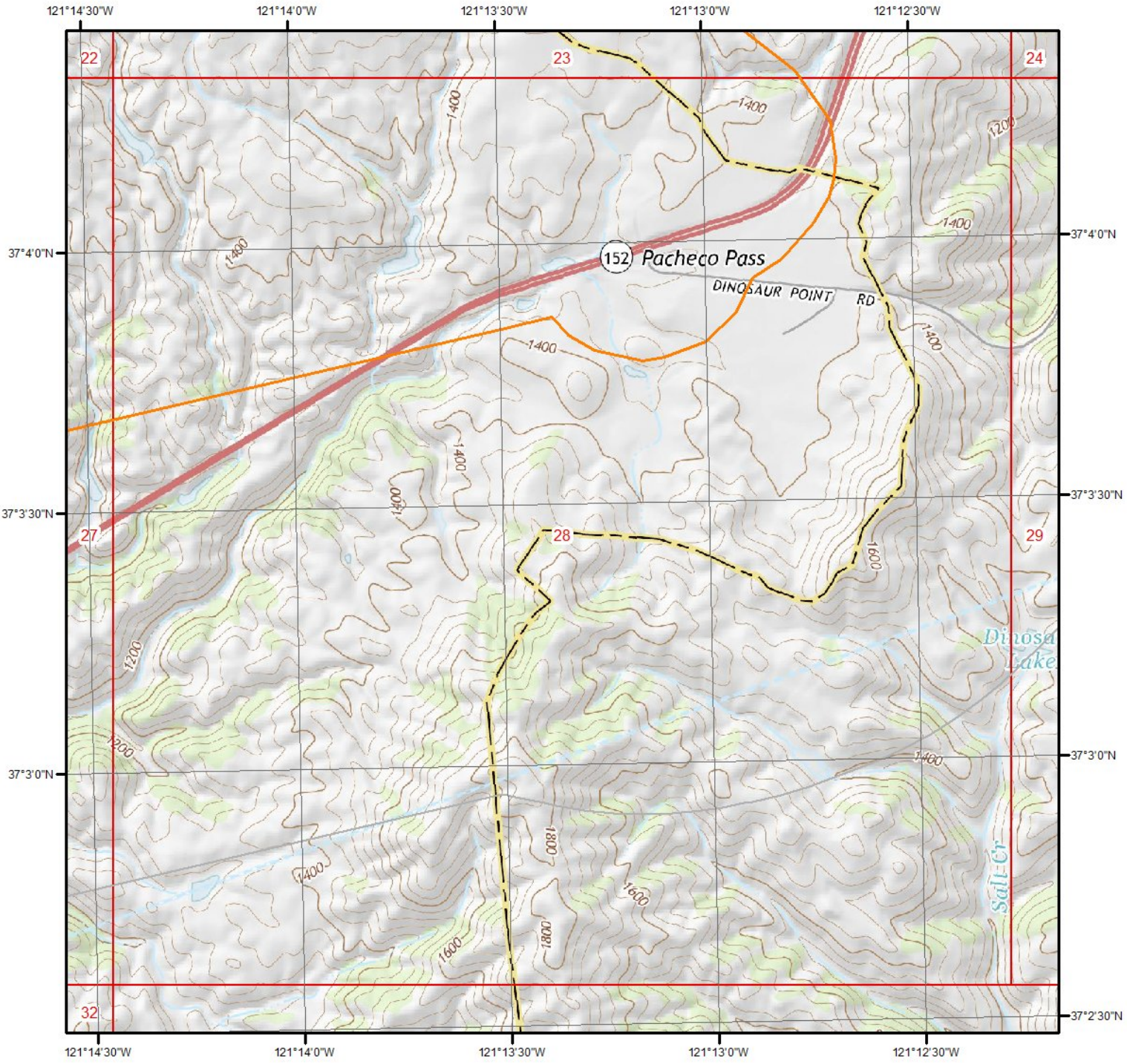
N

Quadrangle(s): Pacheco Pass,CA; Pacheco Peak,CA

Source: USGS 7.5 Minute Topographic Map

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Topographic Information



Current USGS Topo - Page 28

0 0.2 0.4 0.8 Miles

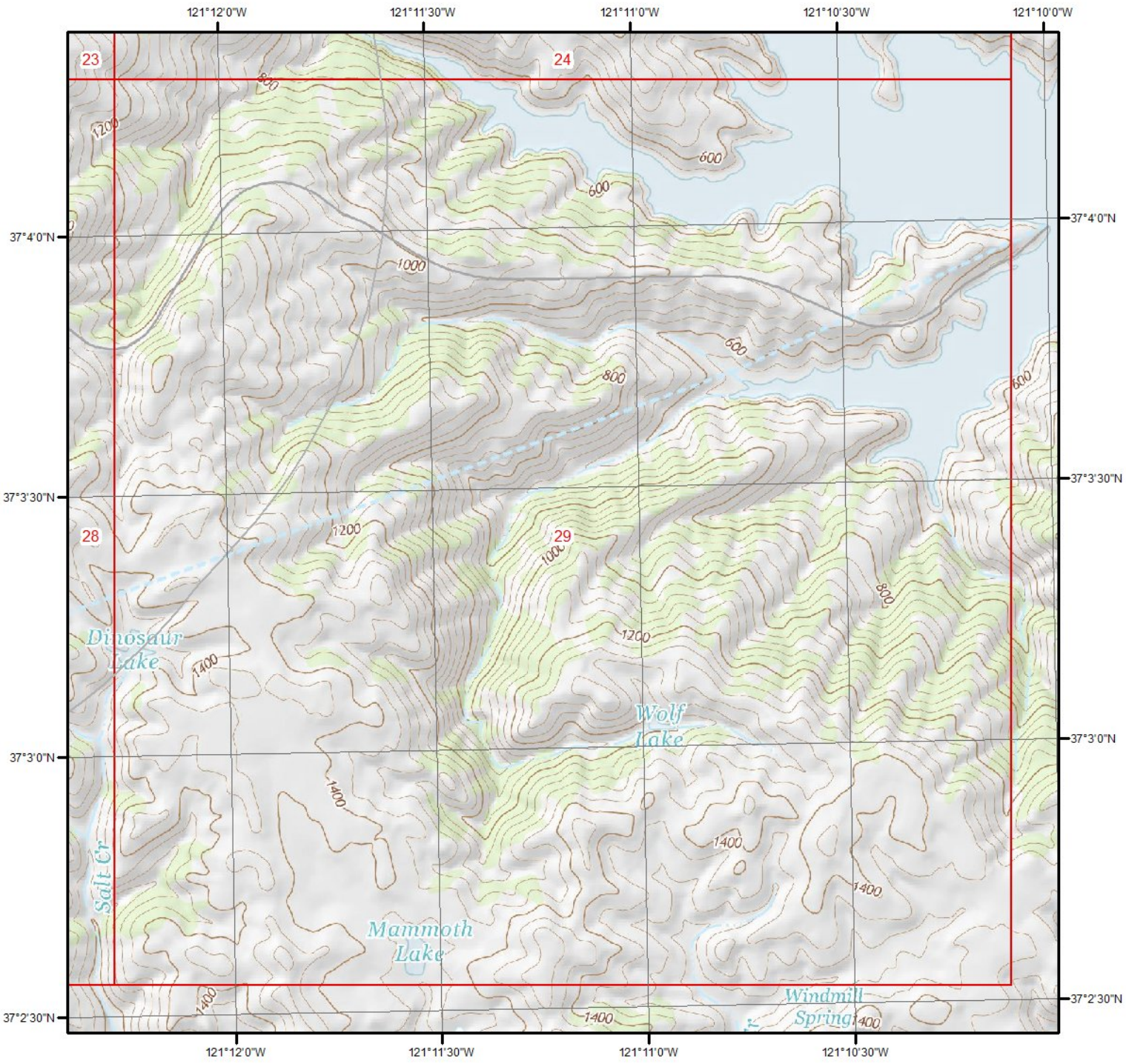
N

Quadrangle(s): Pacheco Pass,CA

Source: USGS 7.5 Minute Topographic Map

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Topographic Information



Current USGS Topo - Page 29

0 0.2 0.4 0.8 Miles

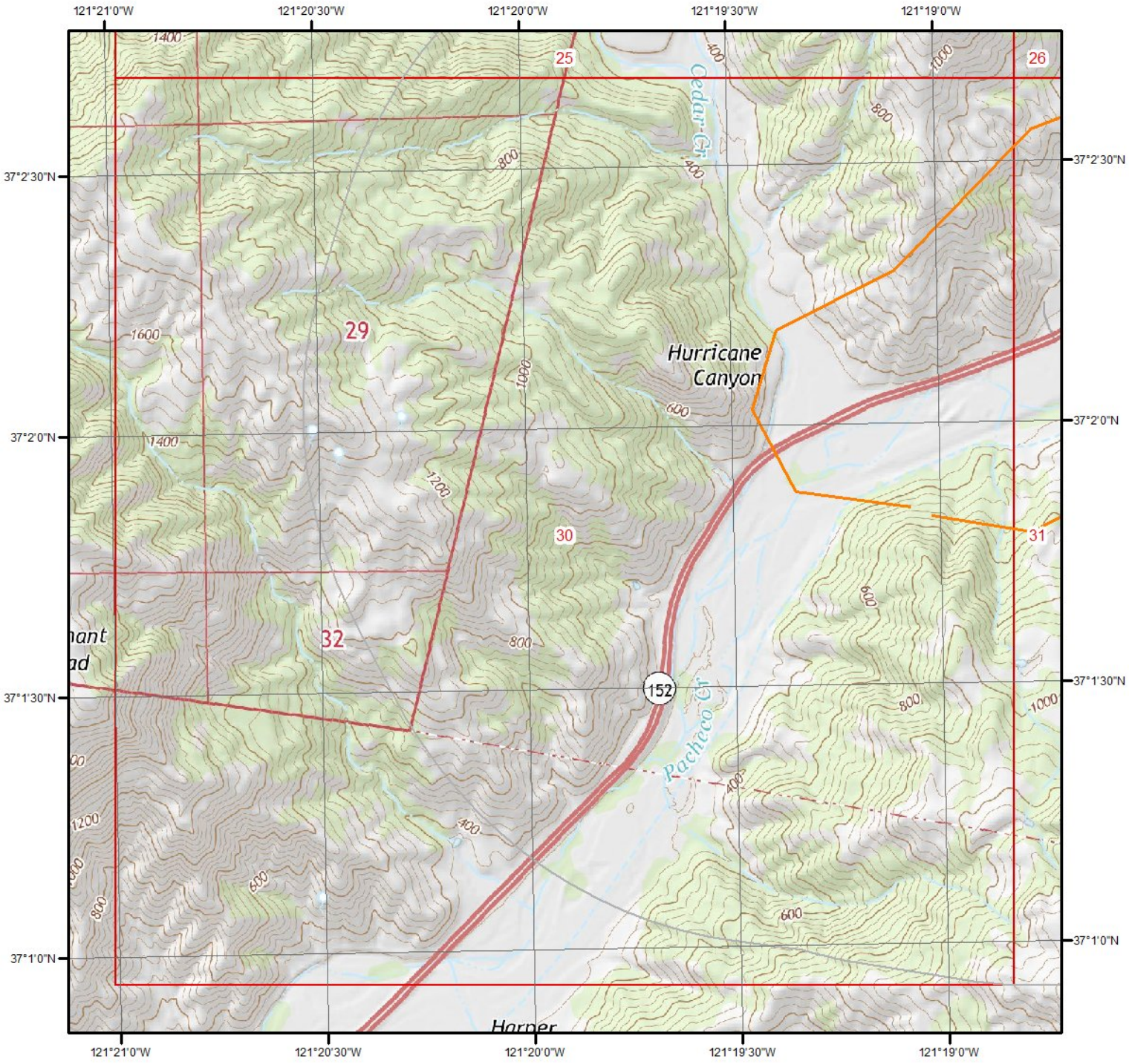
N

Quadrangle(s): Pacheco Pass,CA

Source: USGS 7.5 Minute Topographic Map

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Topographic Information



Current USGS Topo - Page 30

0 0.2 0.4 0.8 Miles

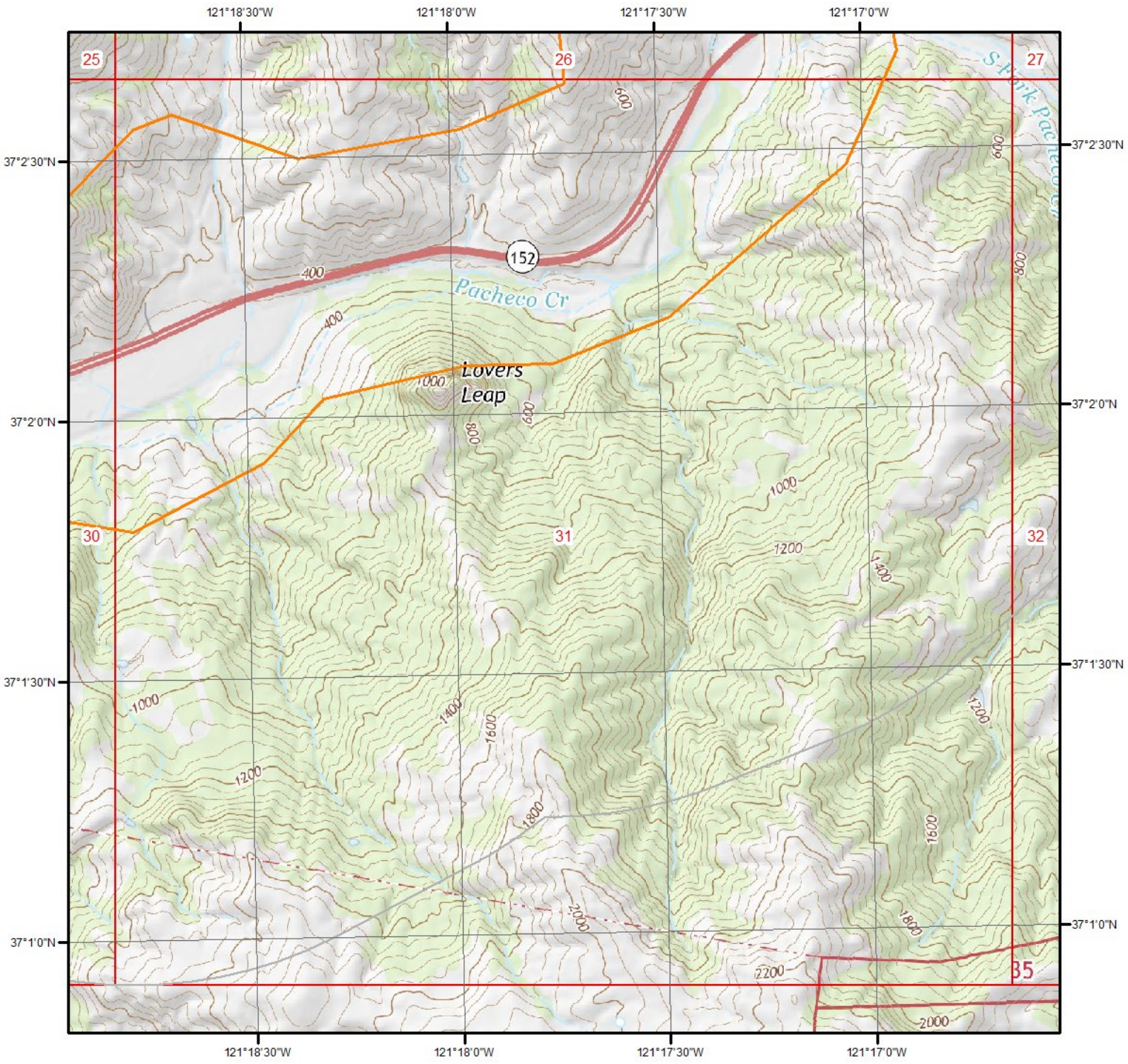
N

Quadrangle(s): Pacheco Peak,CA

Source: USGS 7.5 Minute Topographic Map

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Topographic Information



Current USGS Topo - Page 31

0 0.2 0.4 0.8 Miles

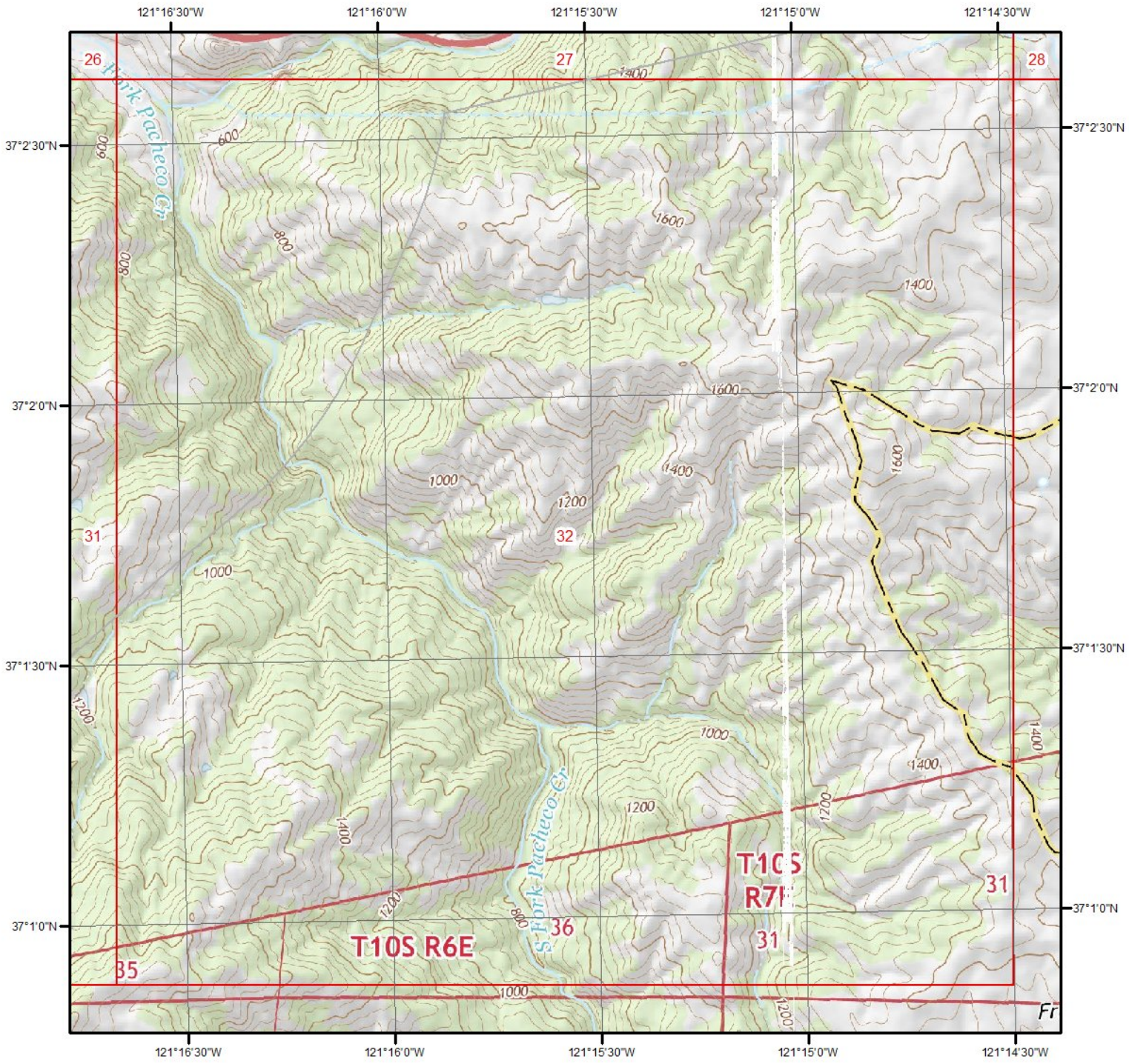
N

Quadrangle(s): Pacheco Peak,CA

Source: USGS 7.5 Minute Topographic Map

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Topographic Information



Current USGS Topo - Page 32

0 0.2 0.4 0.8 Miles

N

Quadrangle(s): Pacheco Pass,CA; Pacheco Peak,CA

Source: USGS 7.5 Minute Topographic Map

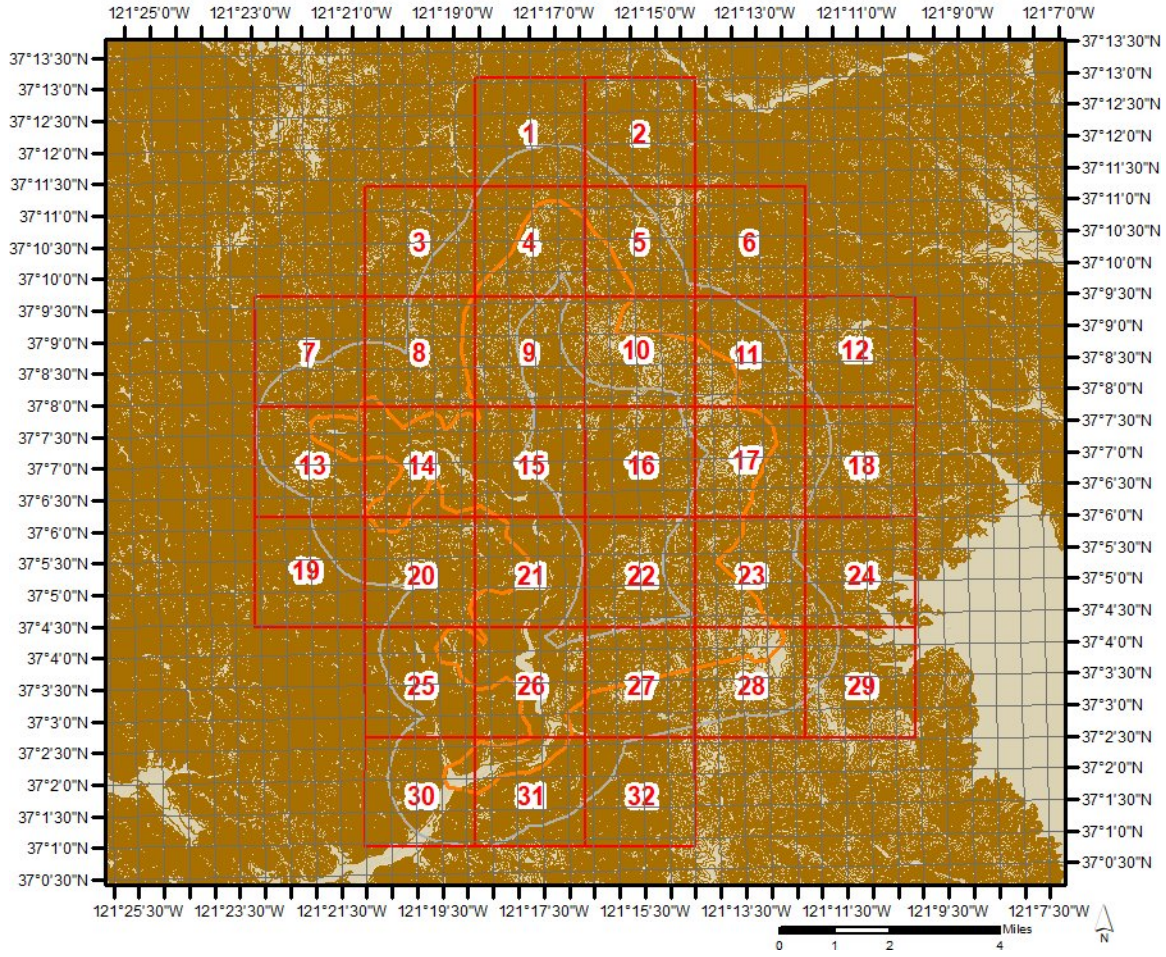
ERIS ENVIRONMENTAL RISK INFORMATION SERVICES

Topographic Information

The previous topographic map(s) are created by seamlessly merging and cutting current USGS topographic data. Below are shaded relief map(s), derived from USGS elevation data to show surrounding topography in further detail.

Topographic information at project property:

Elevation:	1,224.15 ft
Slope Direction:	W



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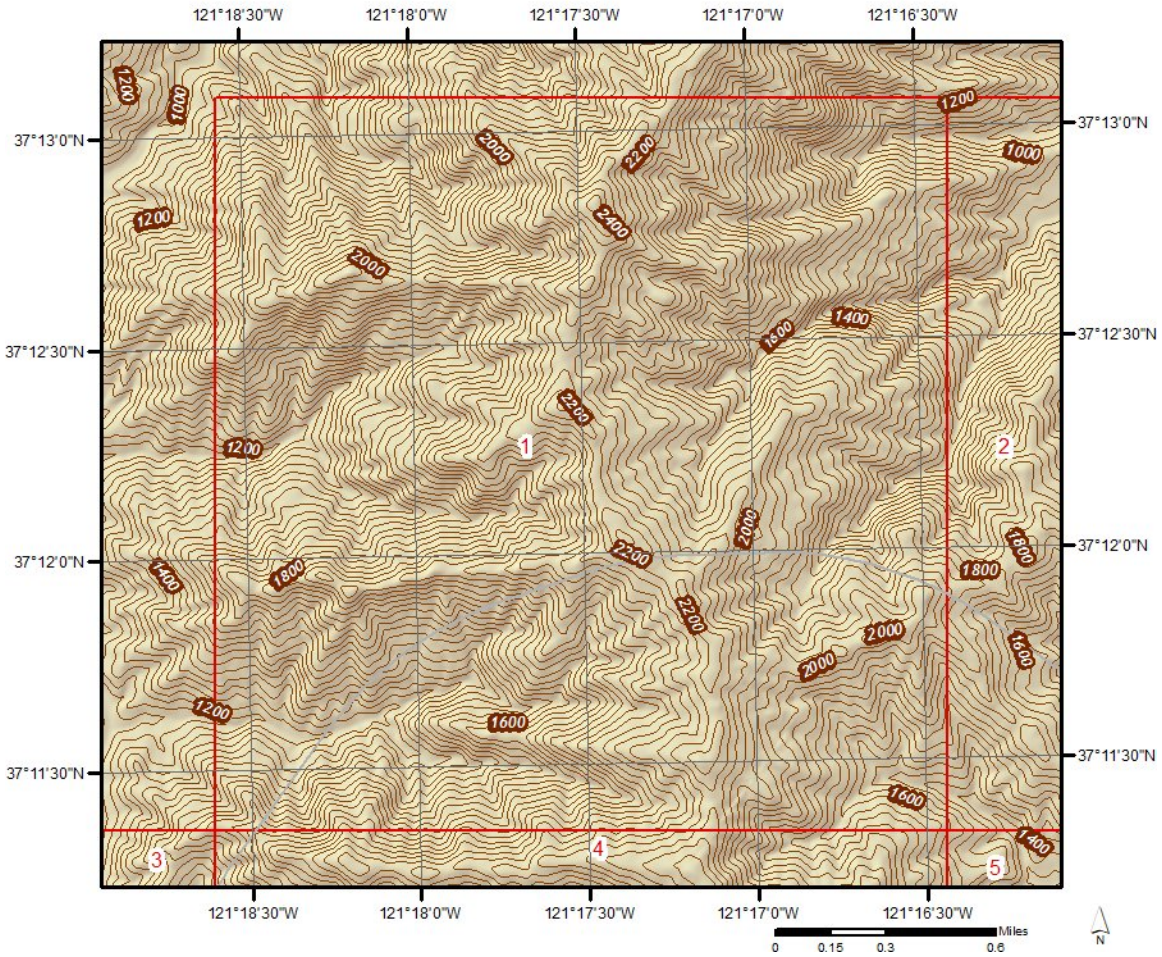

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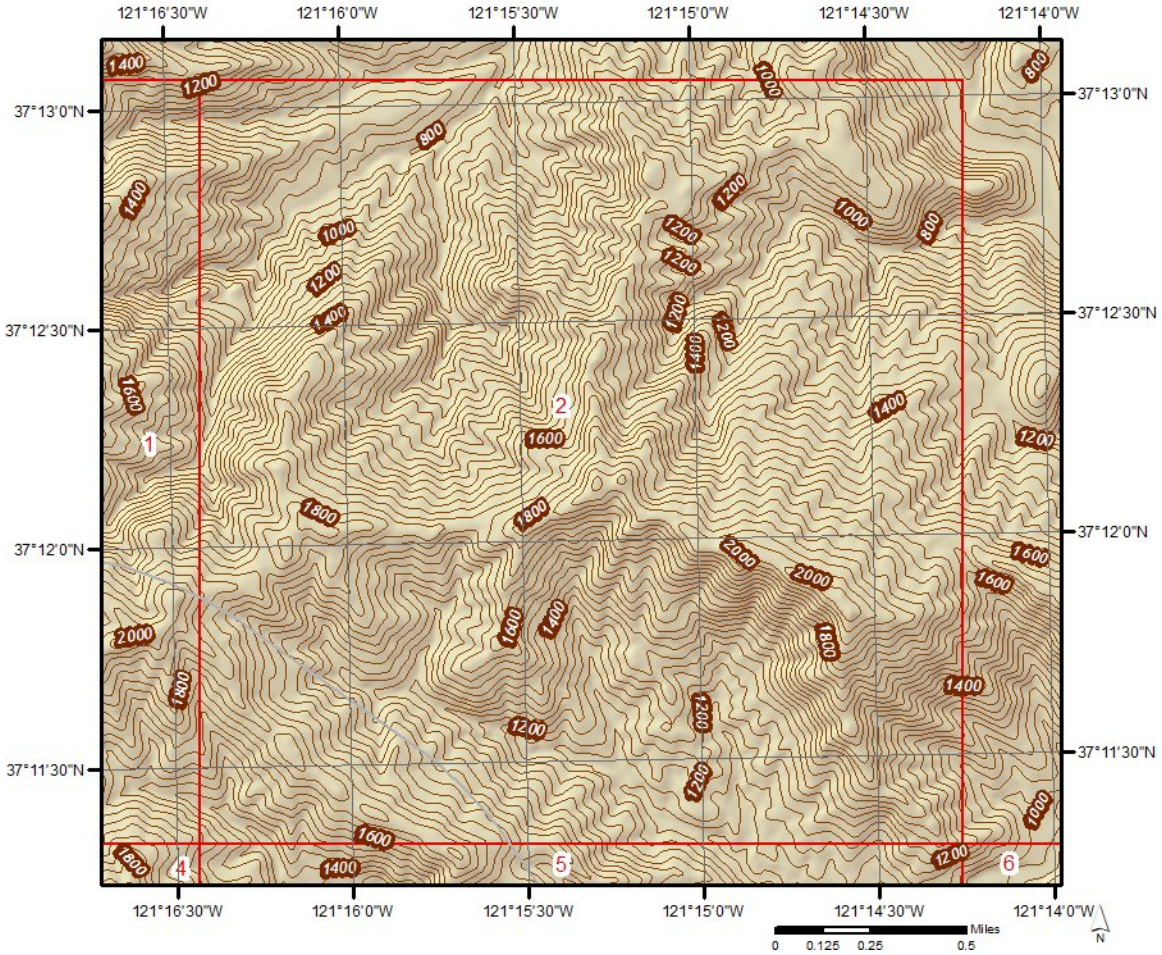

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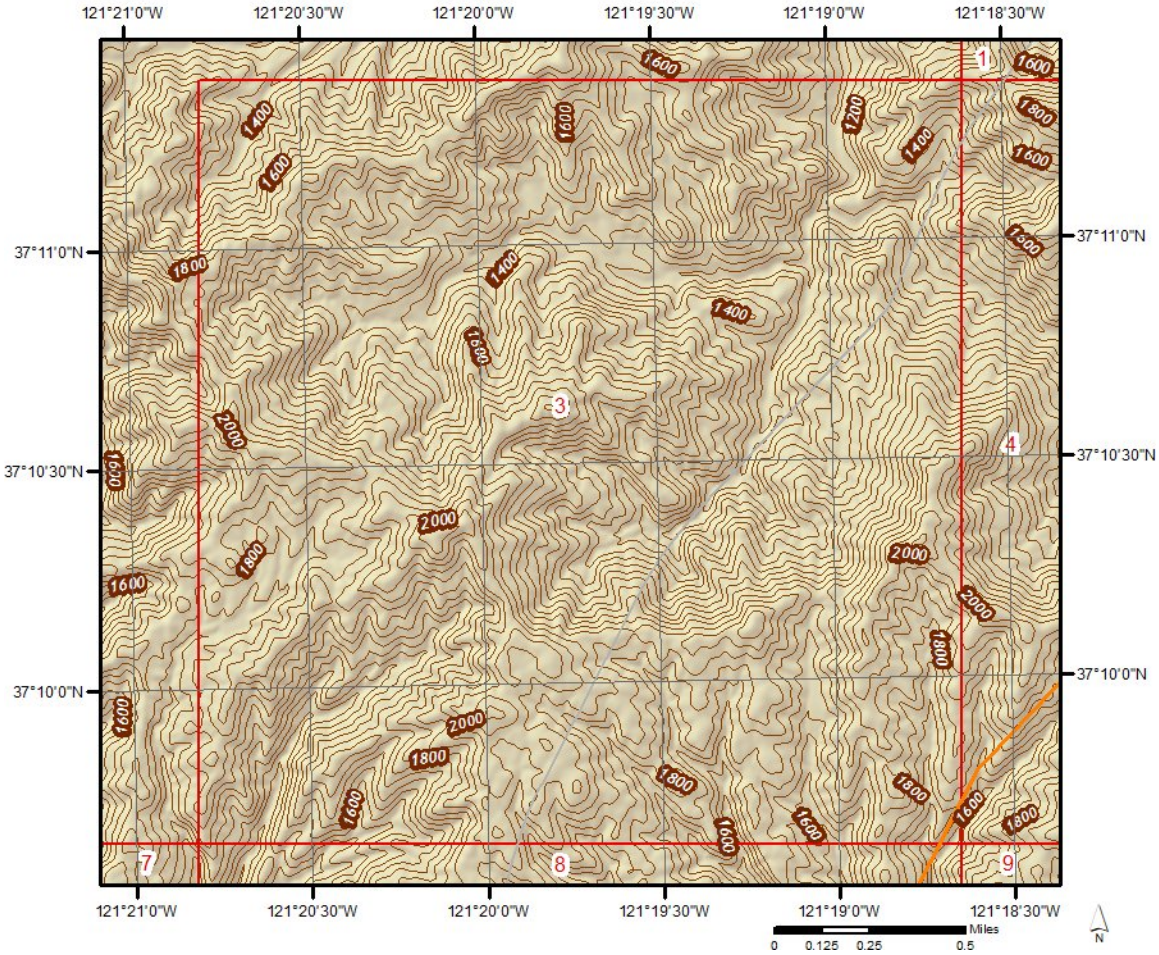

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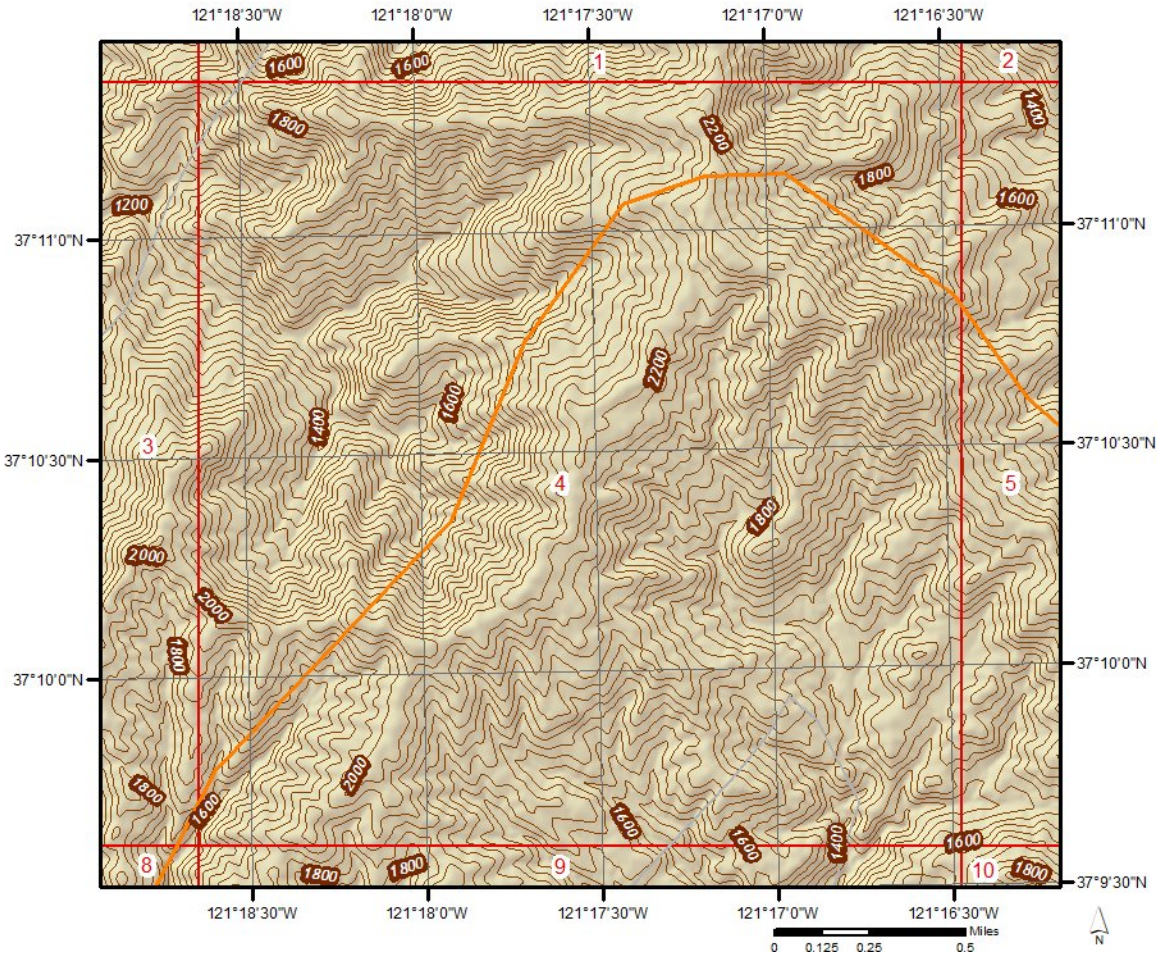

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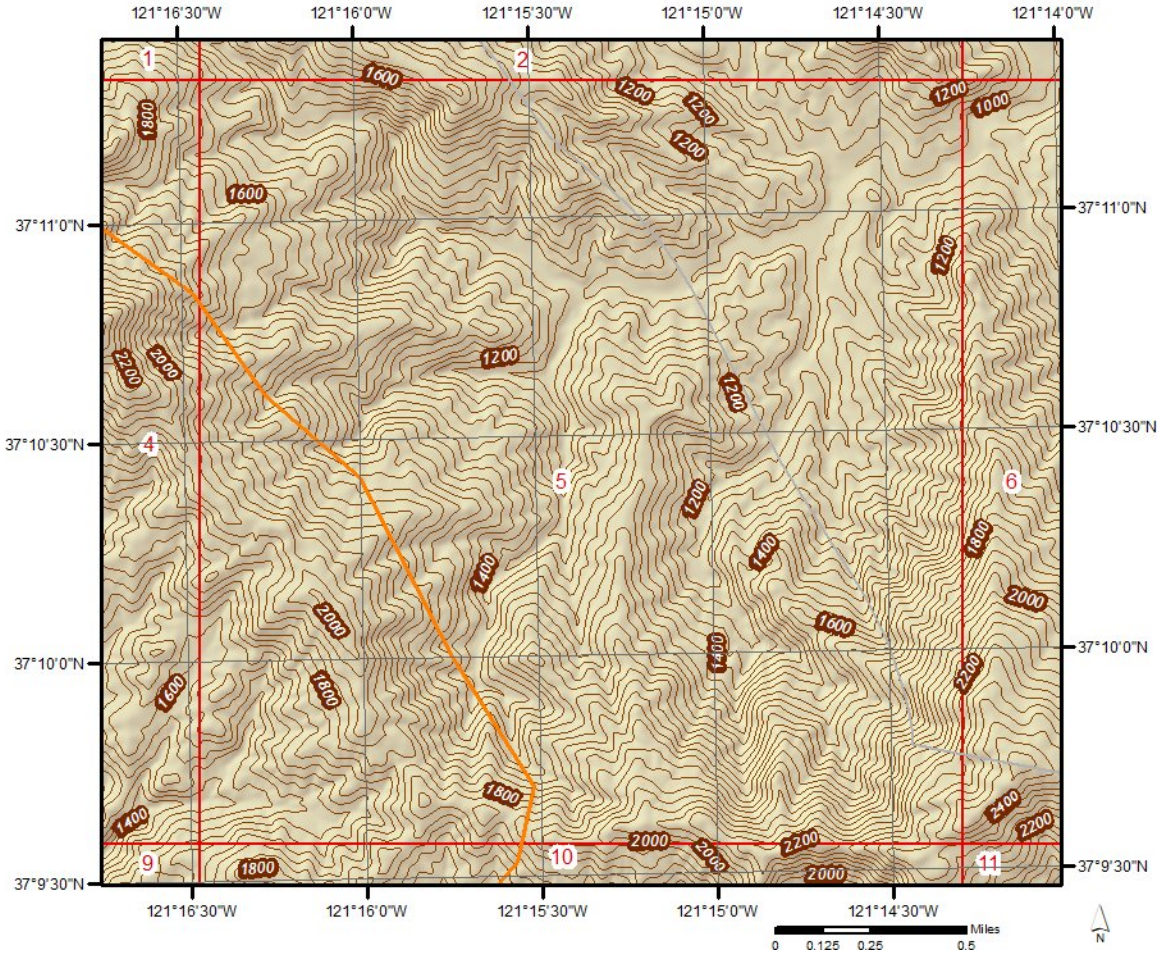

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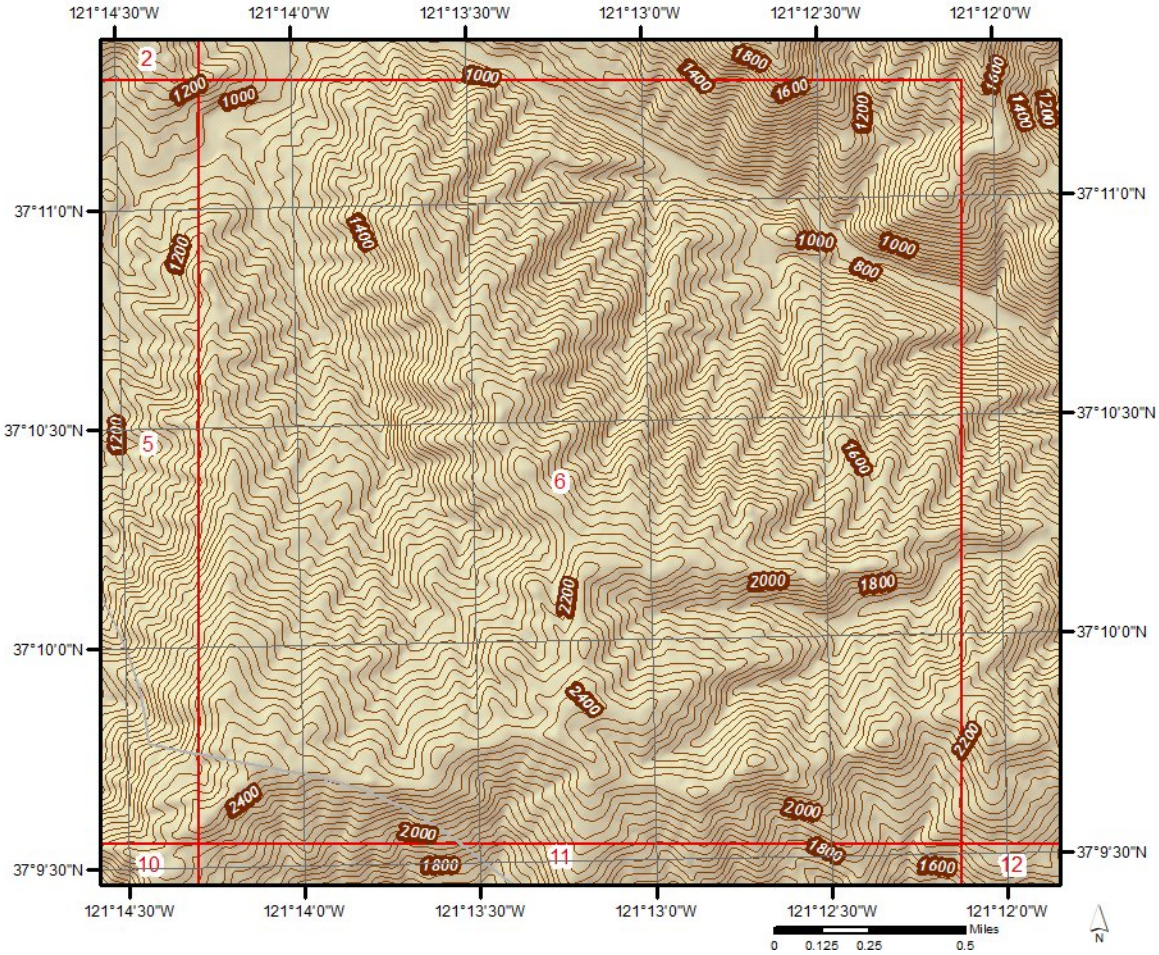

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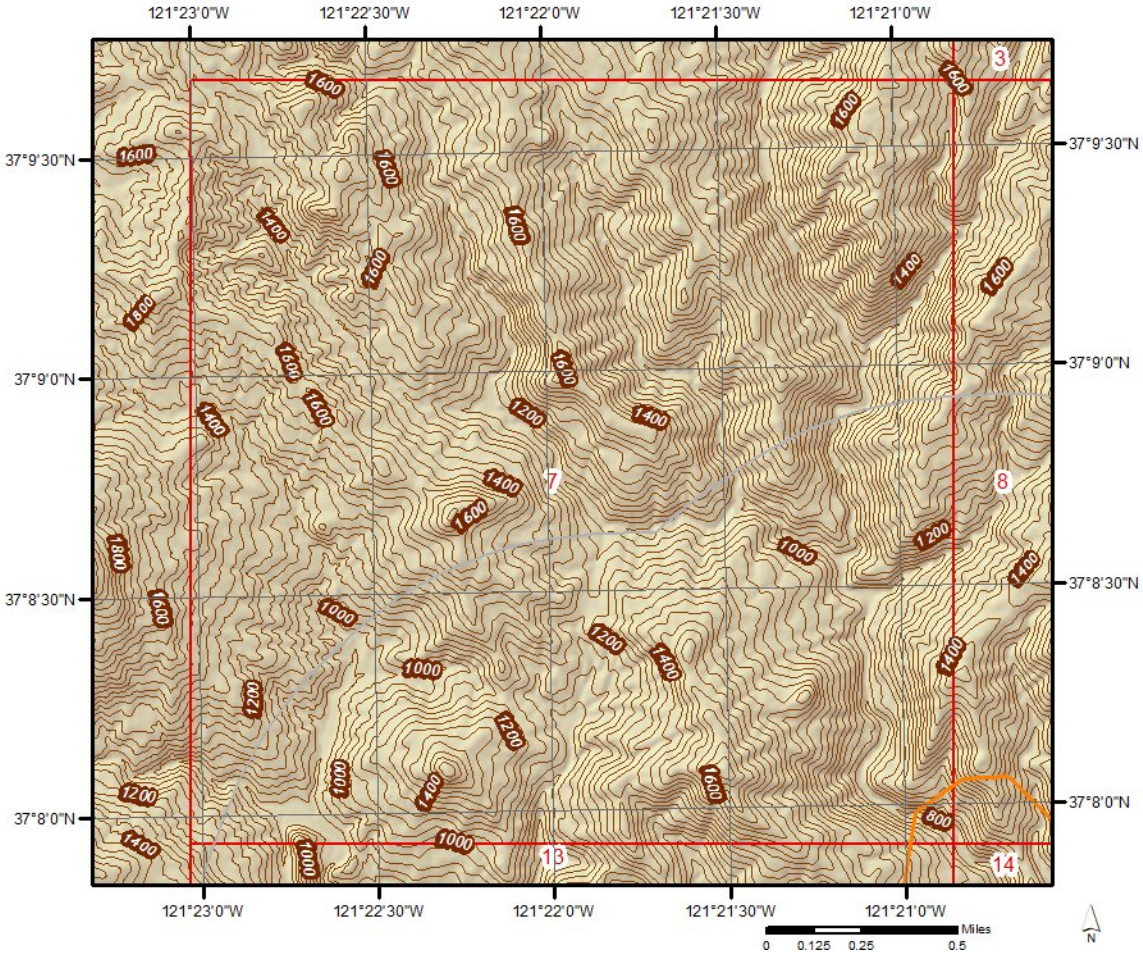

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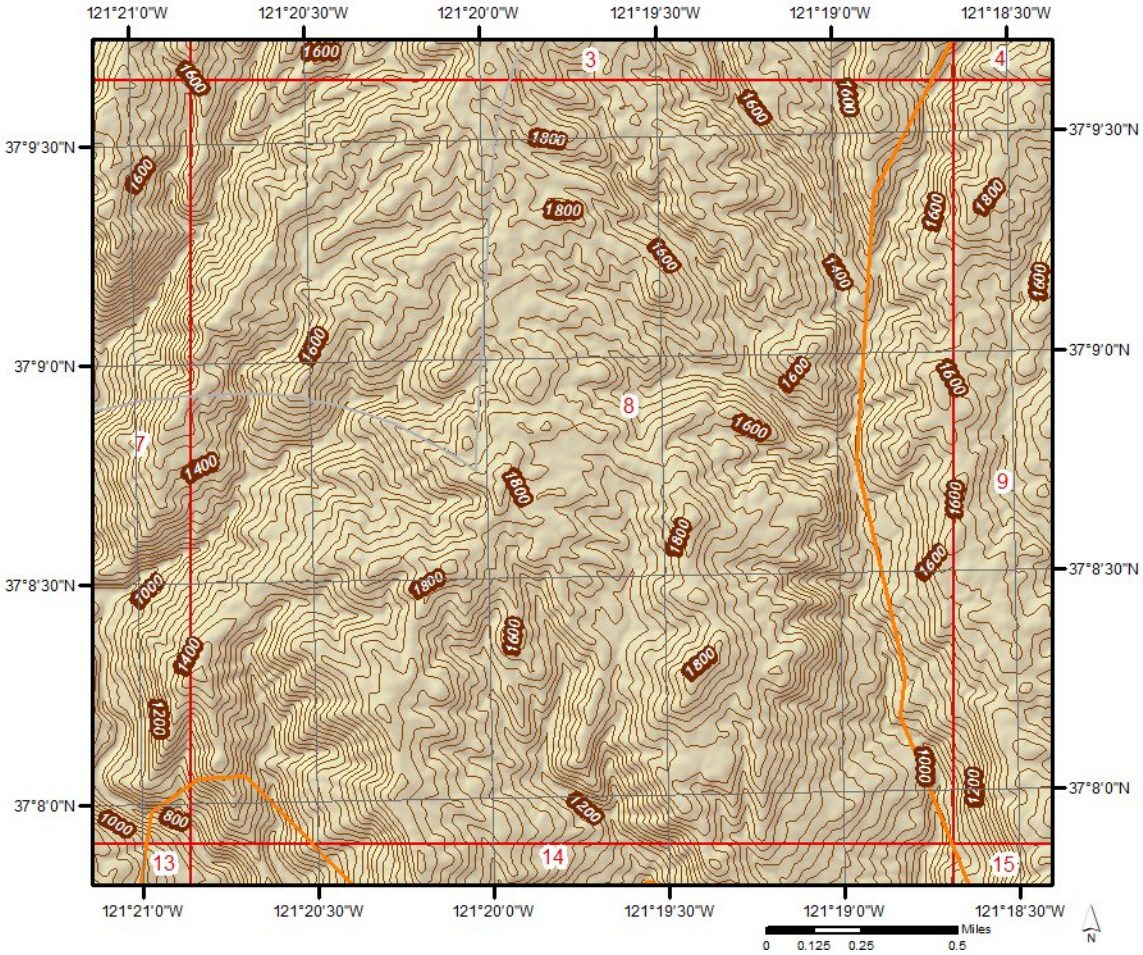

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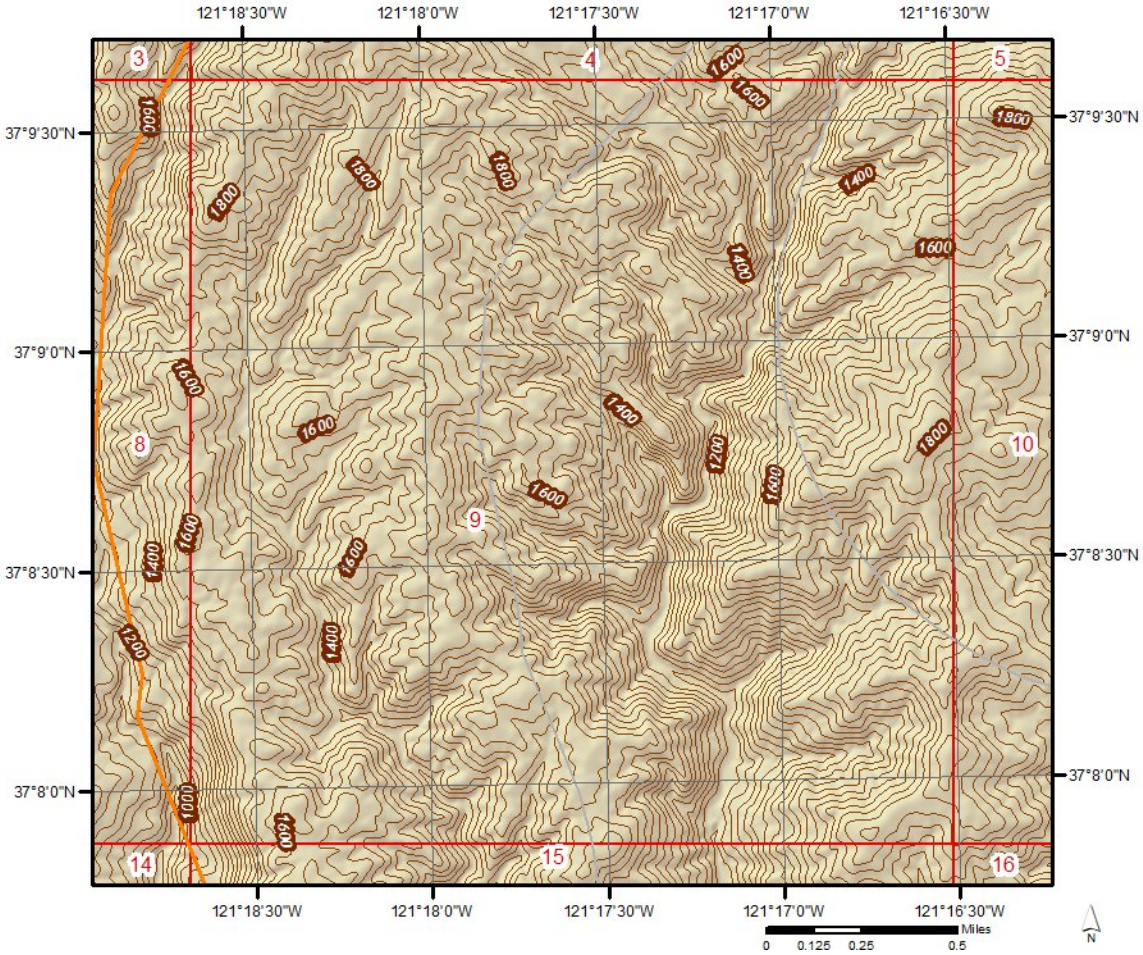

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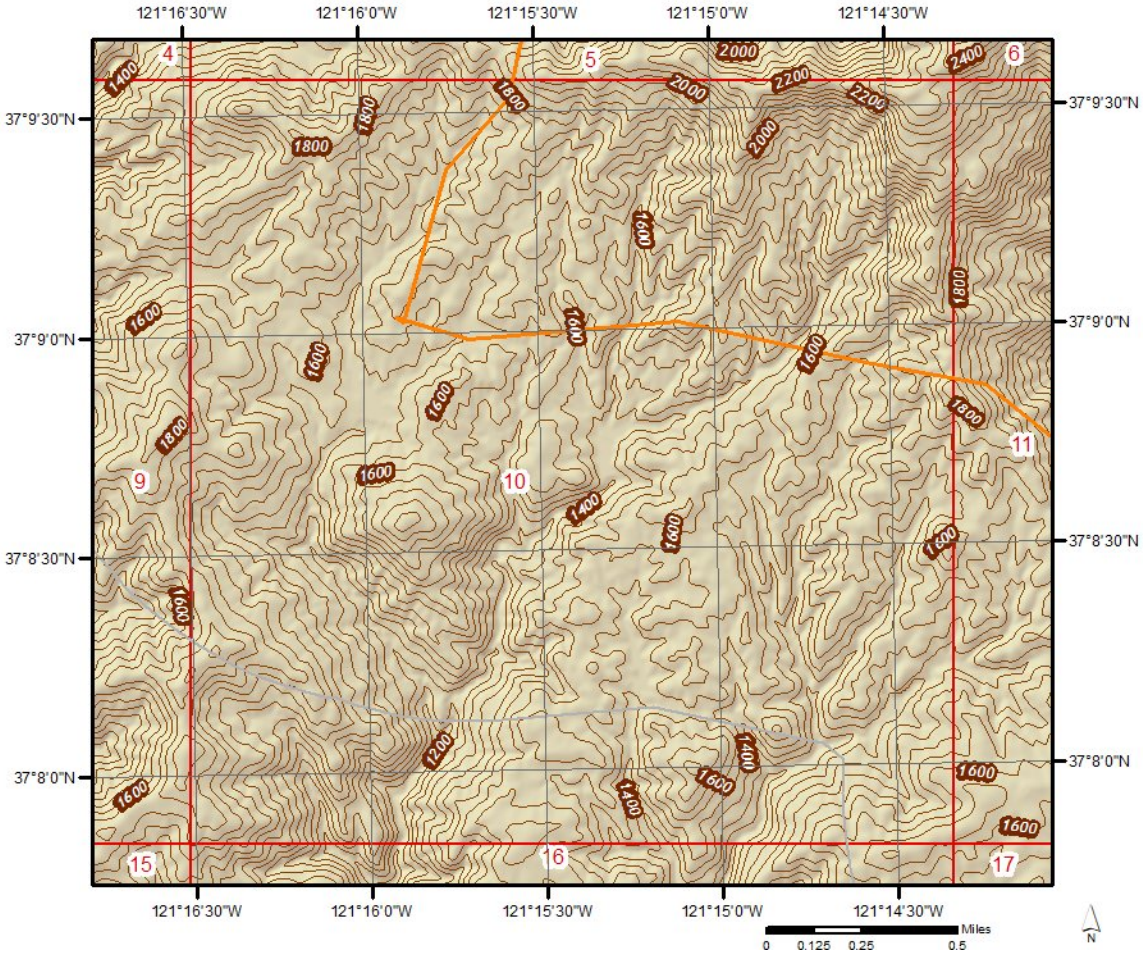

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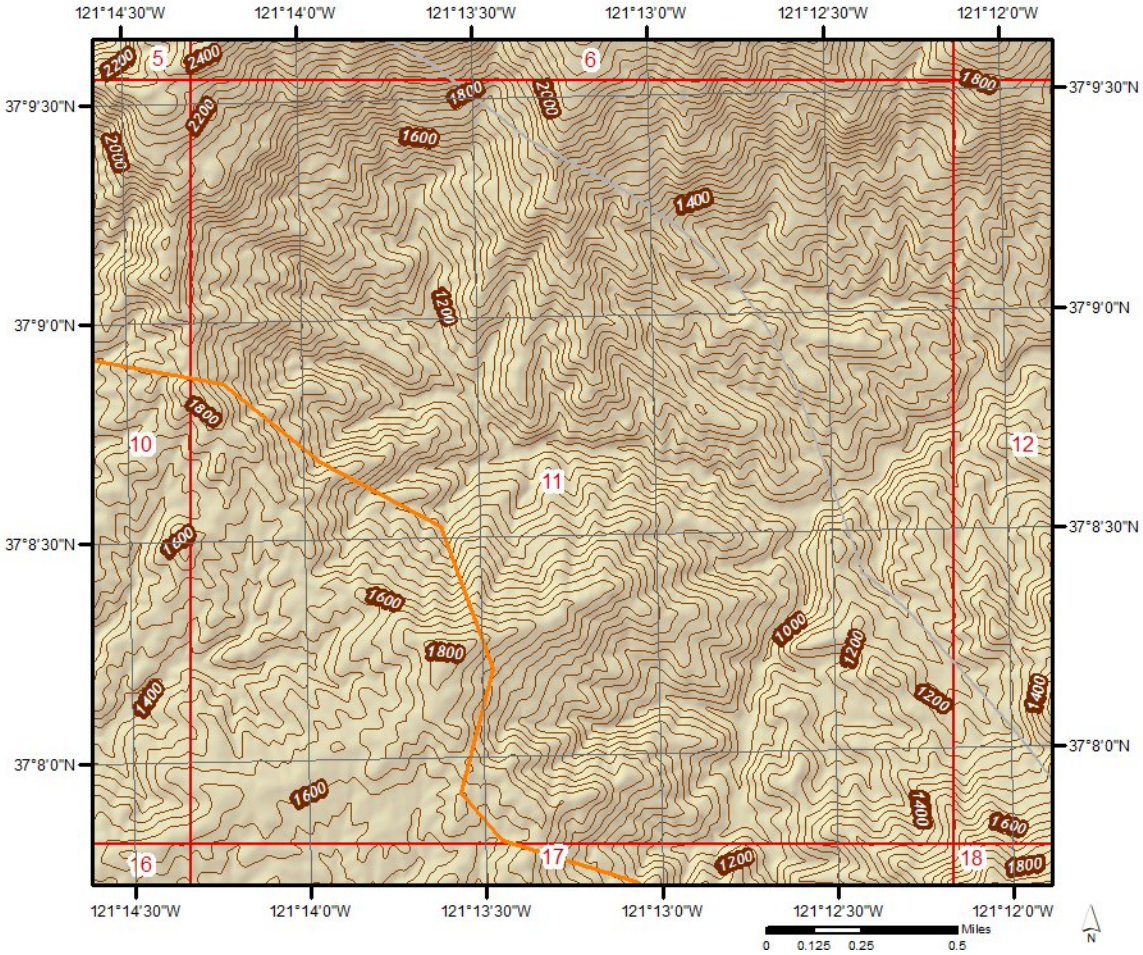

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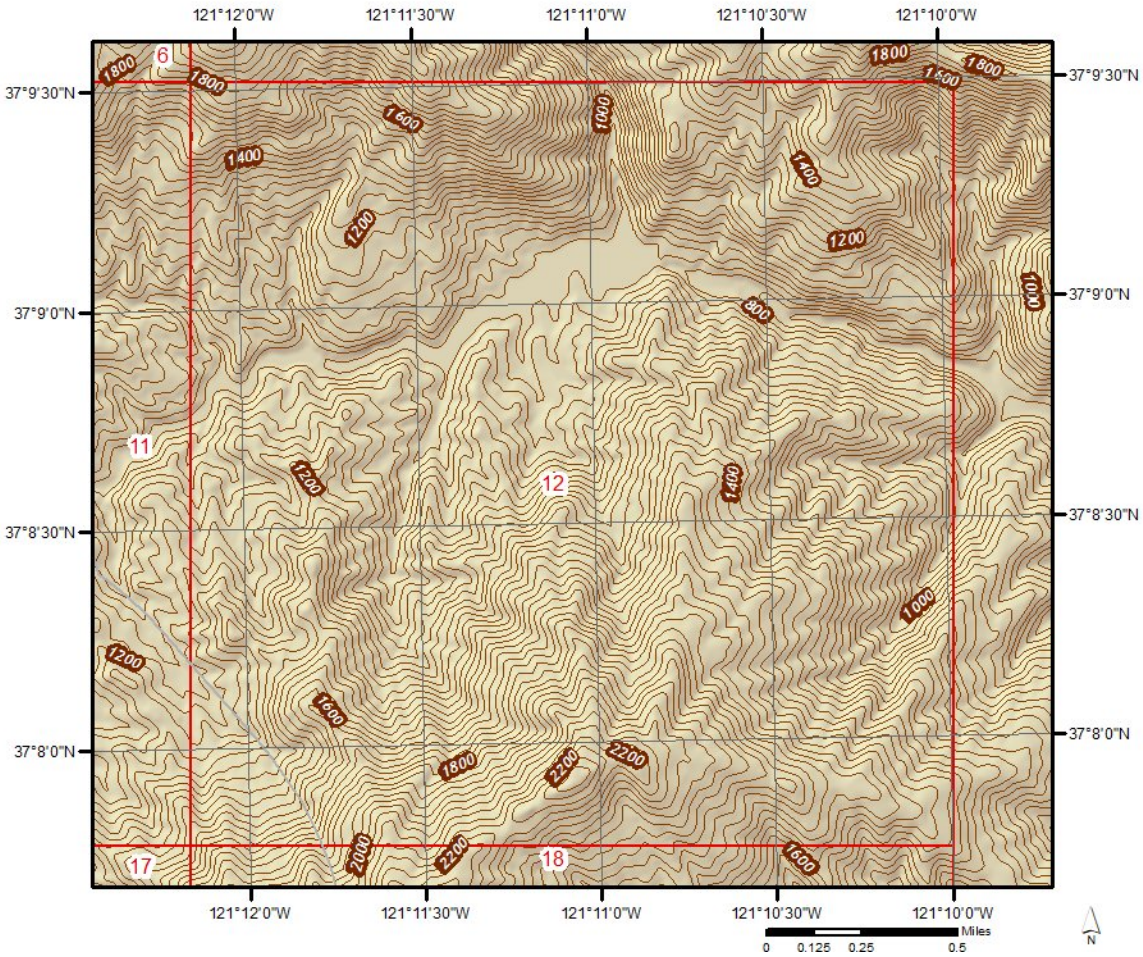

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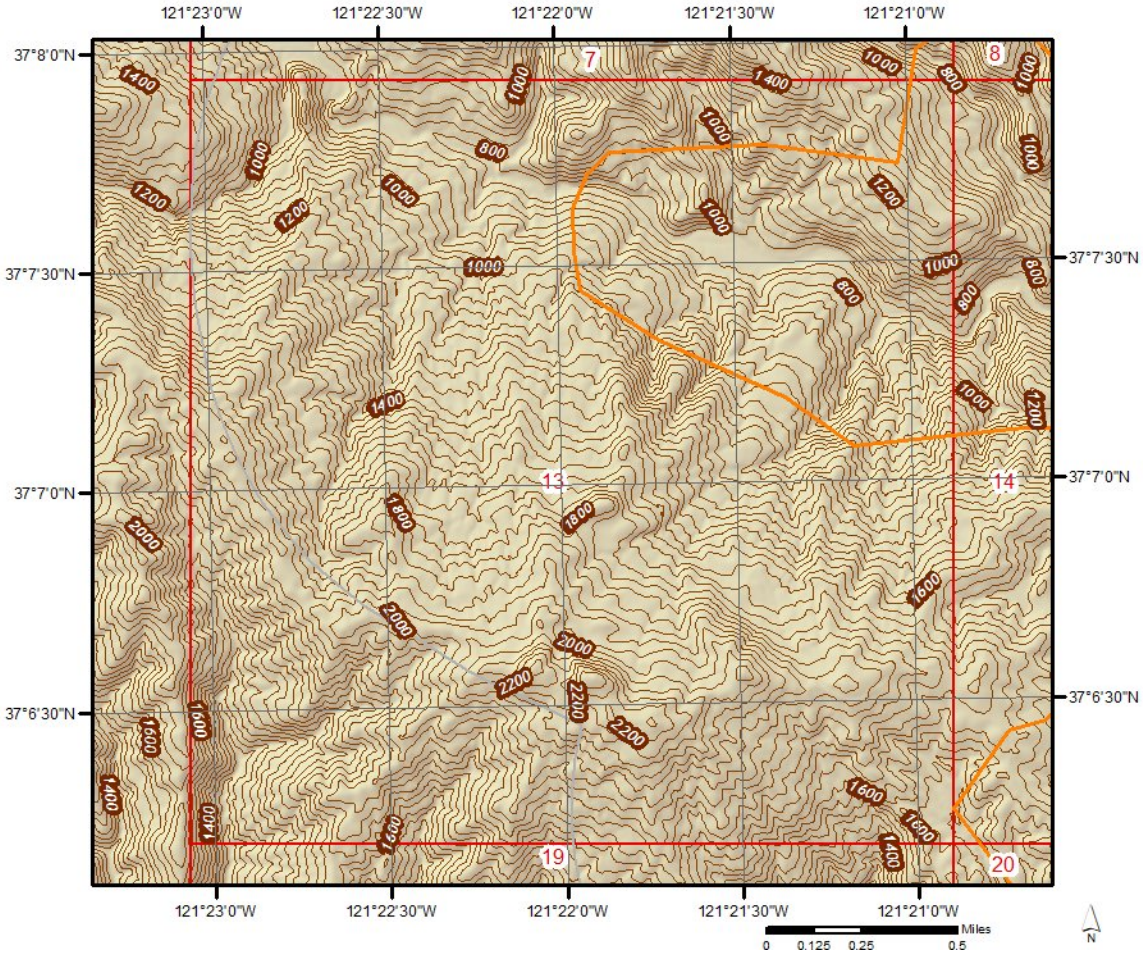

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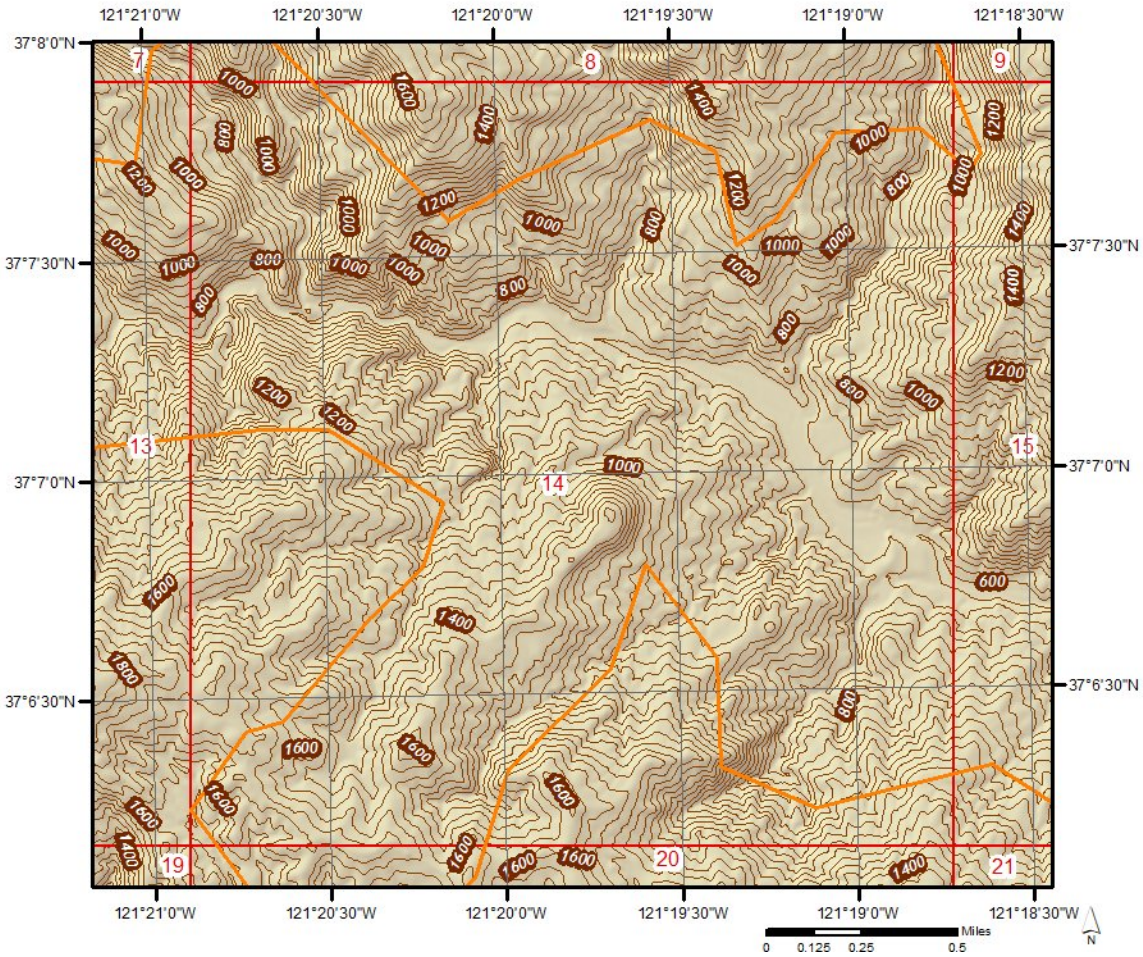

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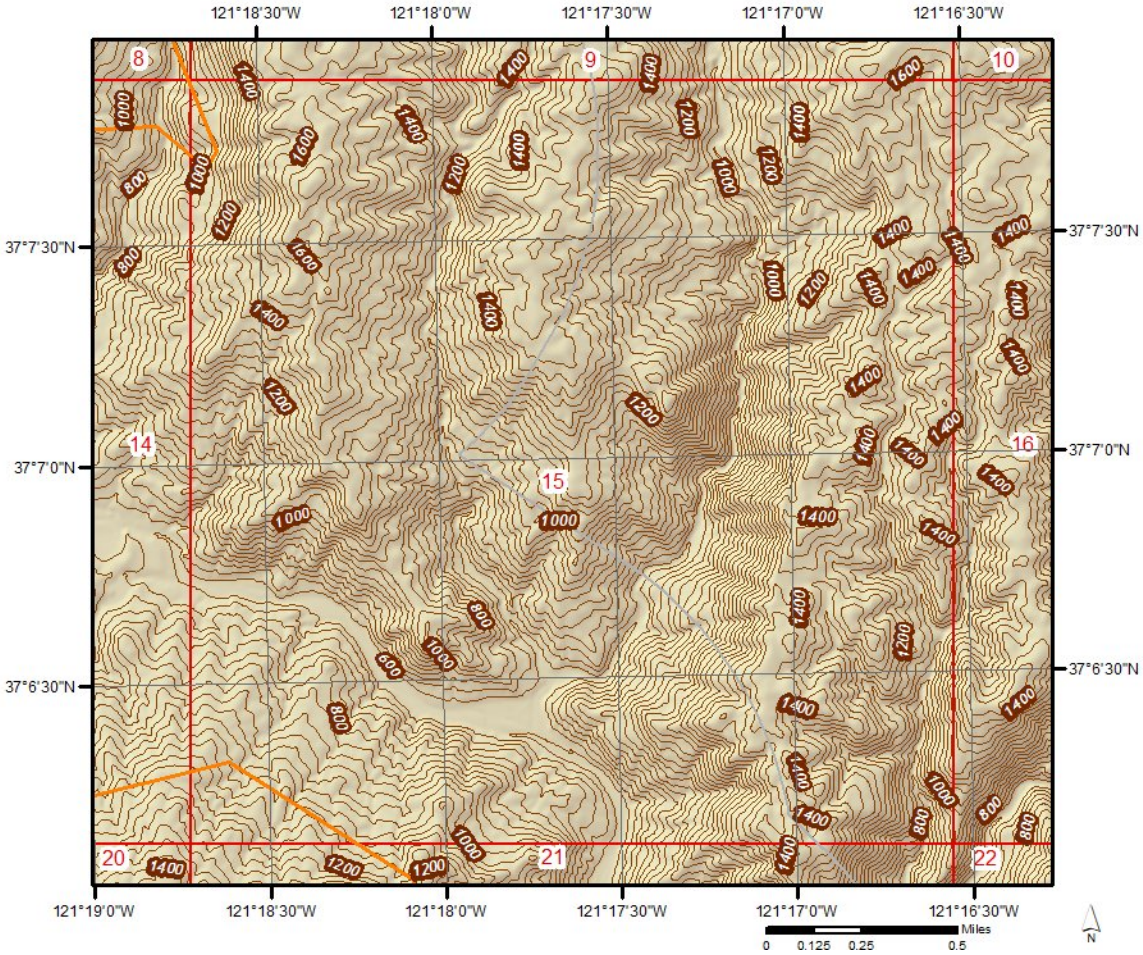

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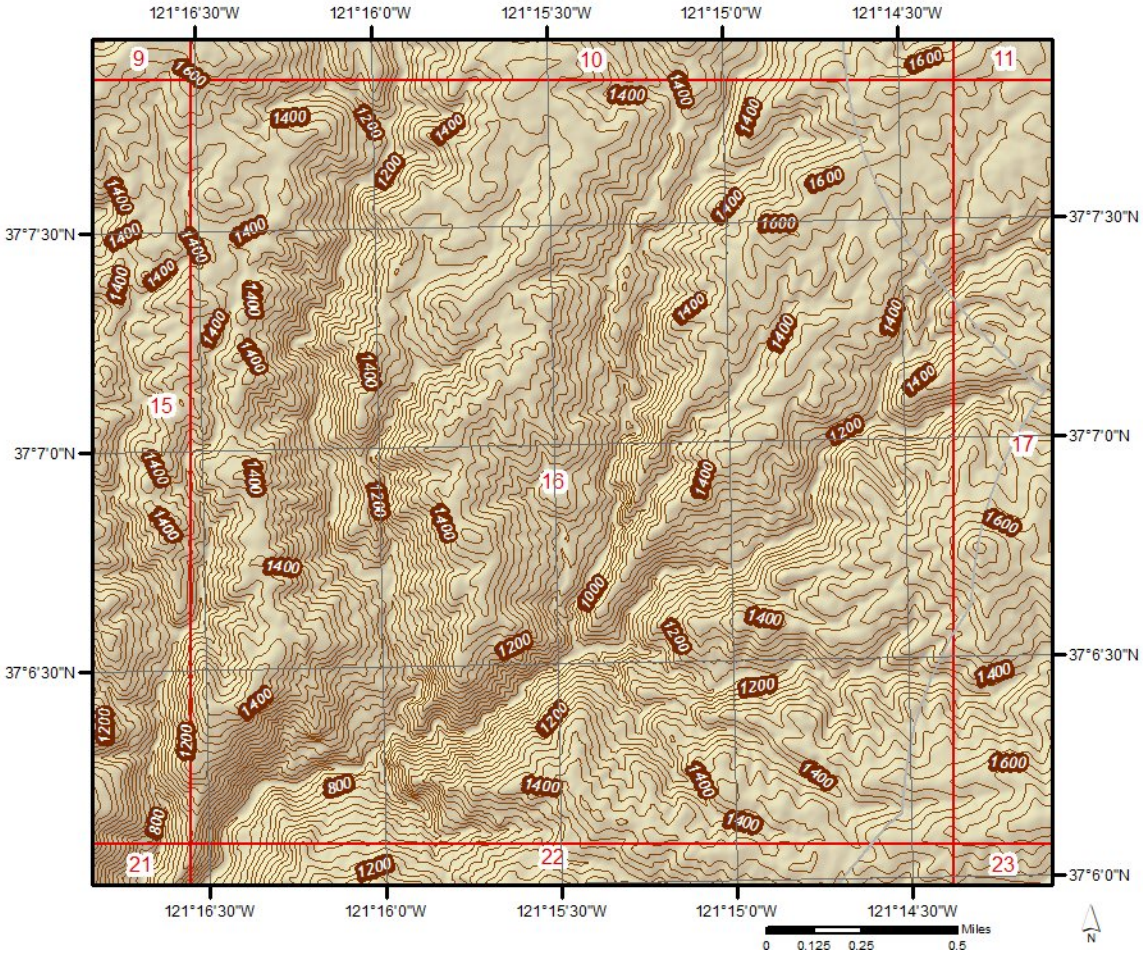

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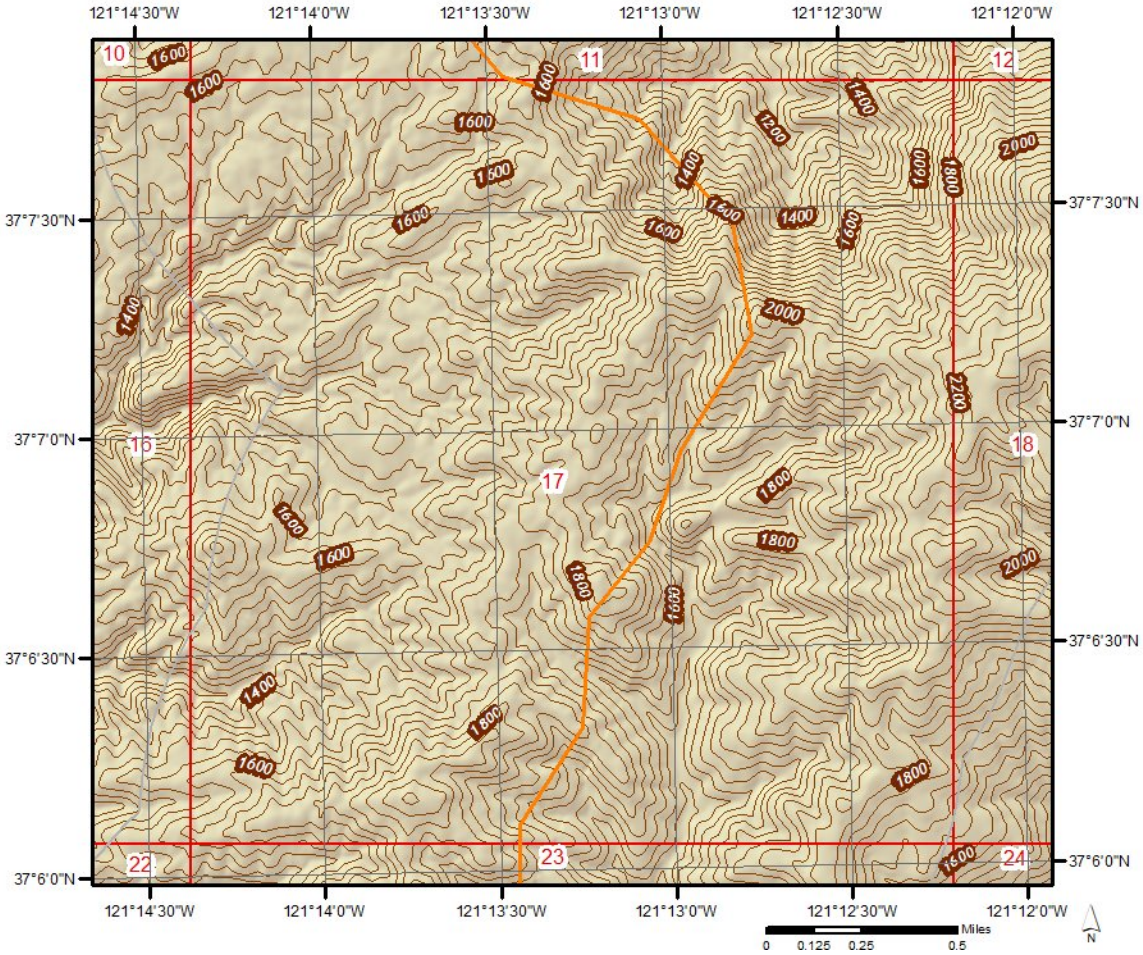

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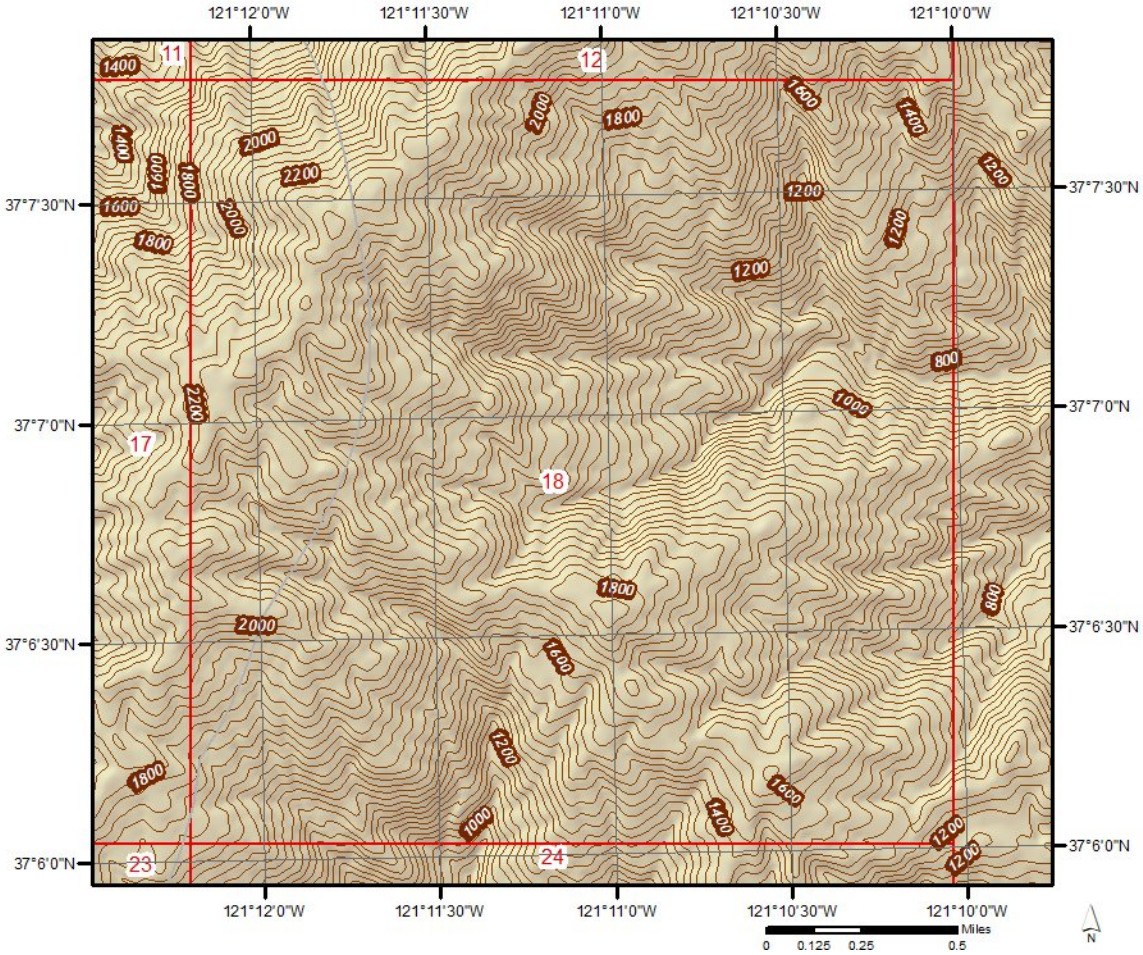

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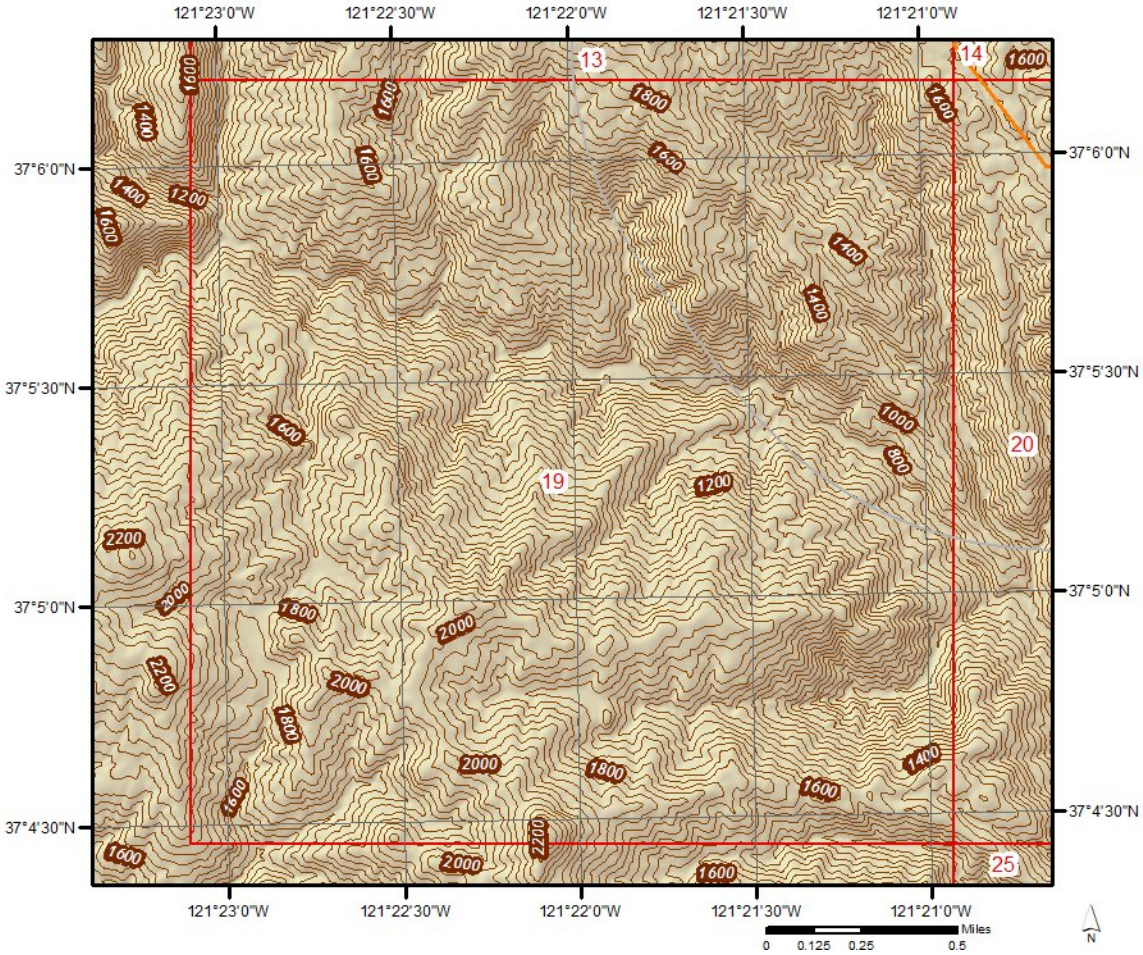

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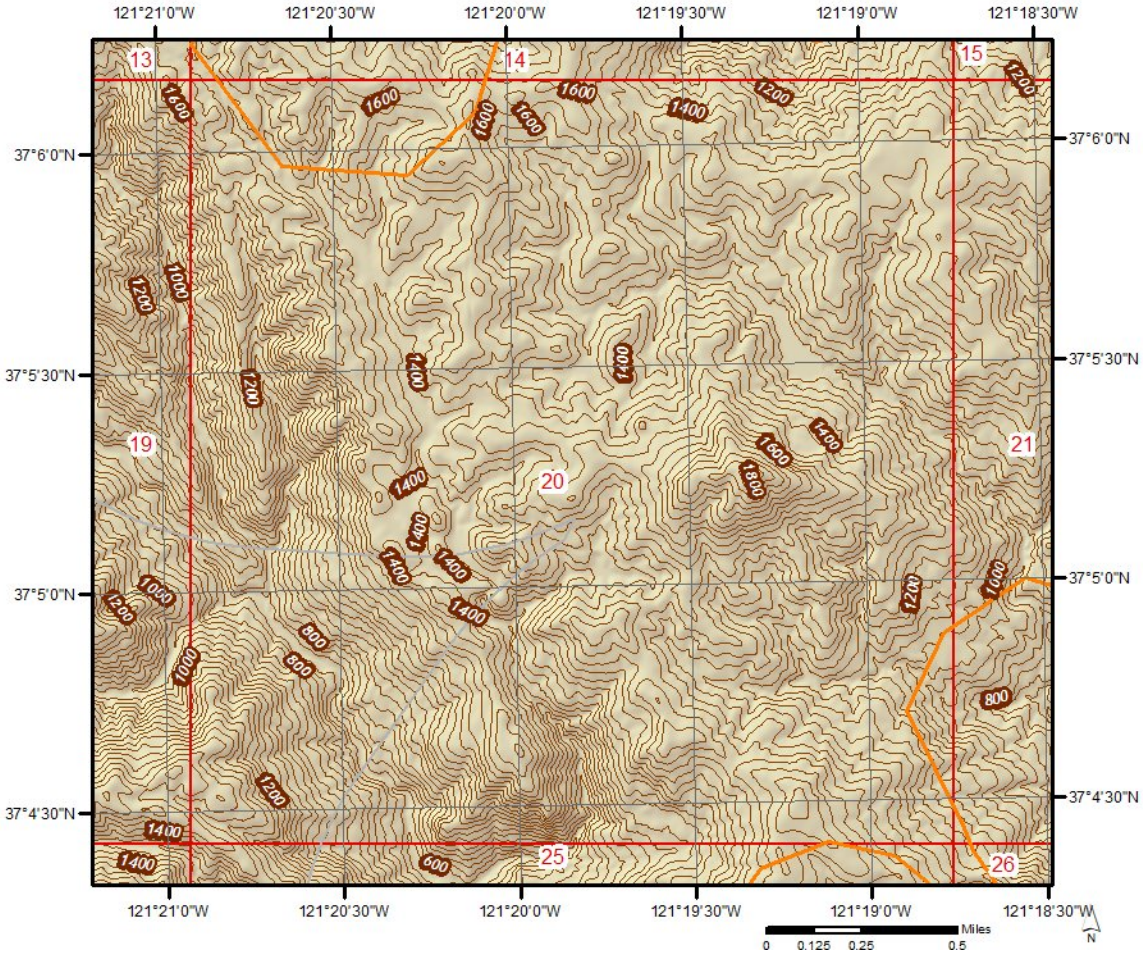

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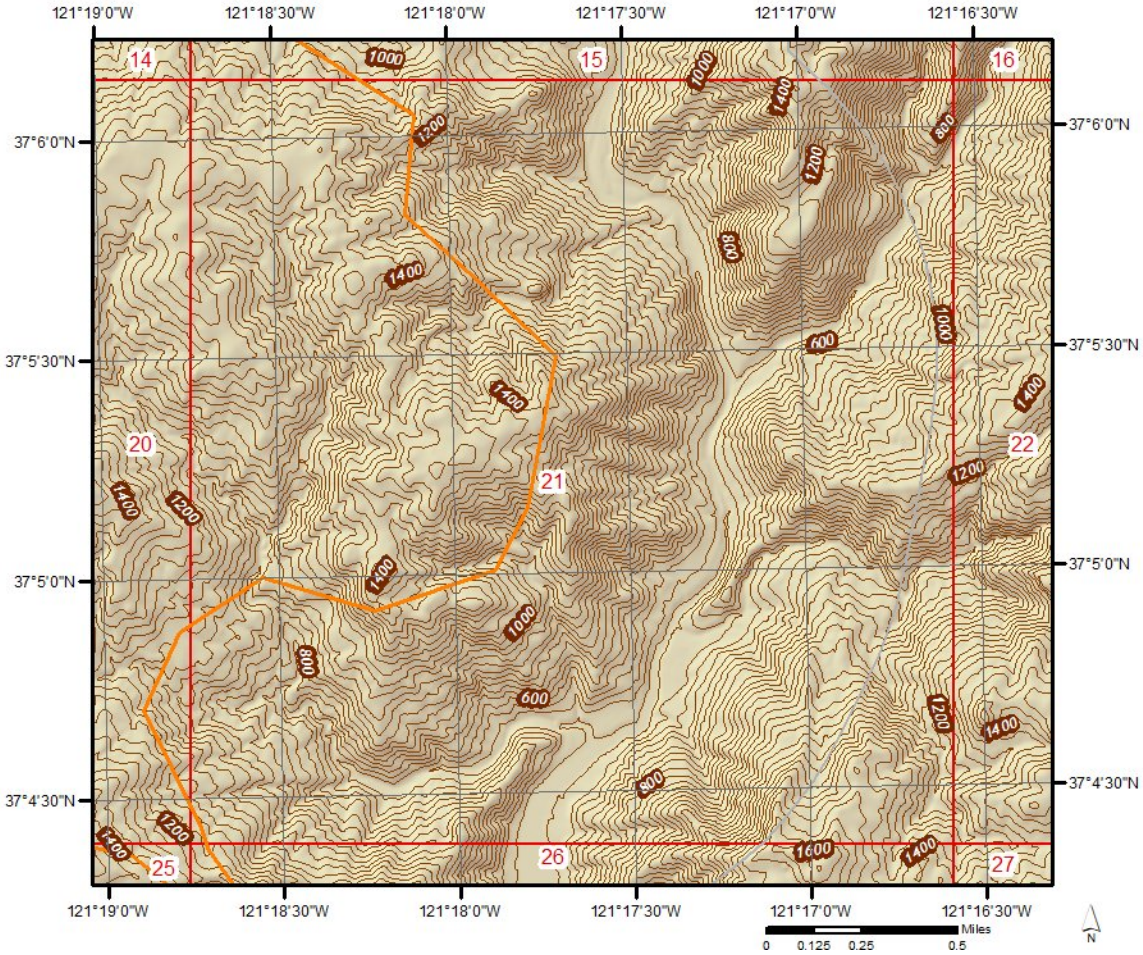

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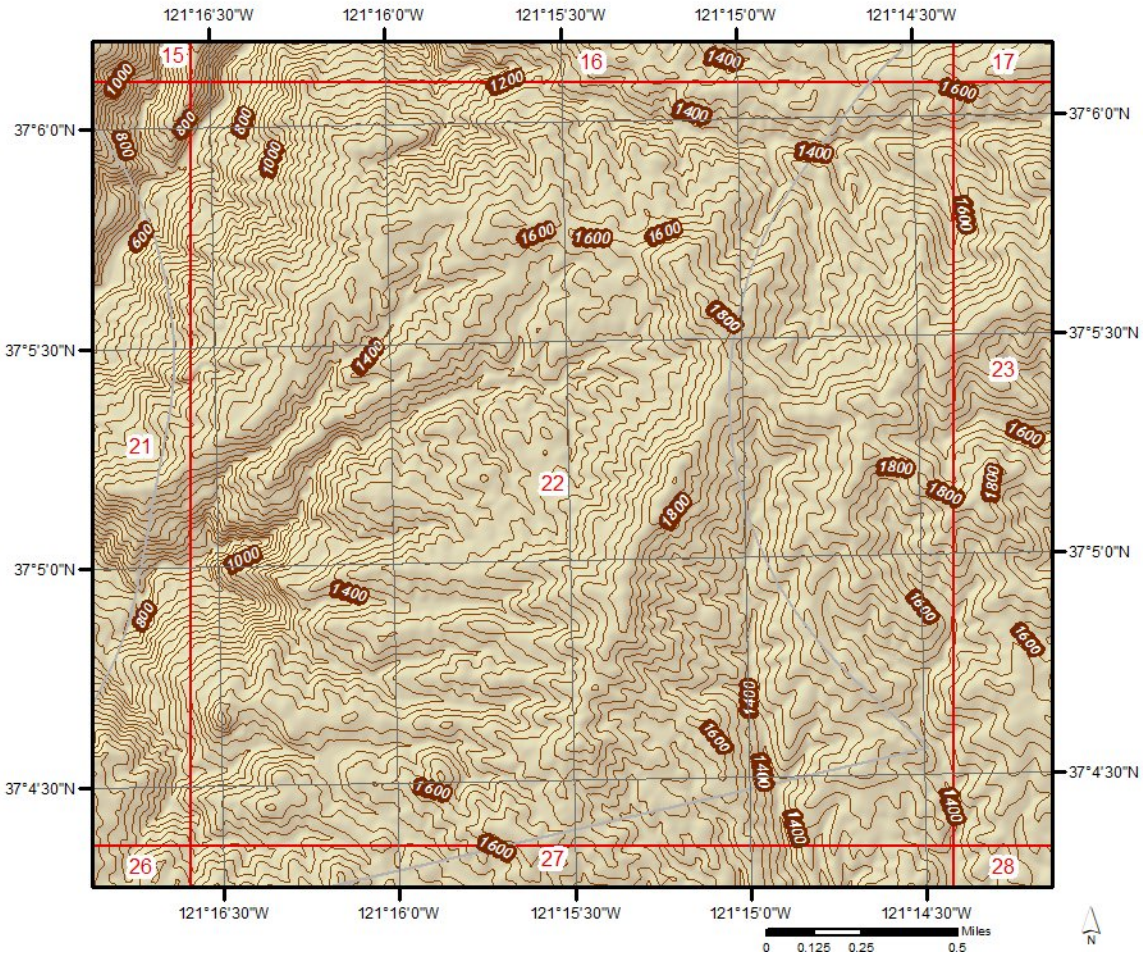

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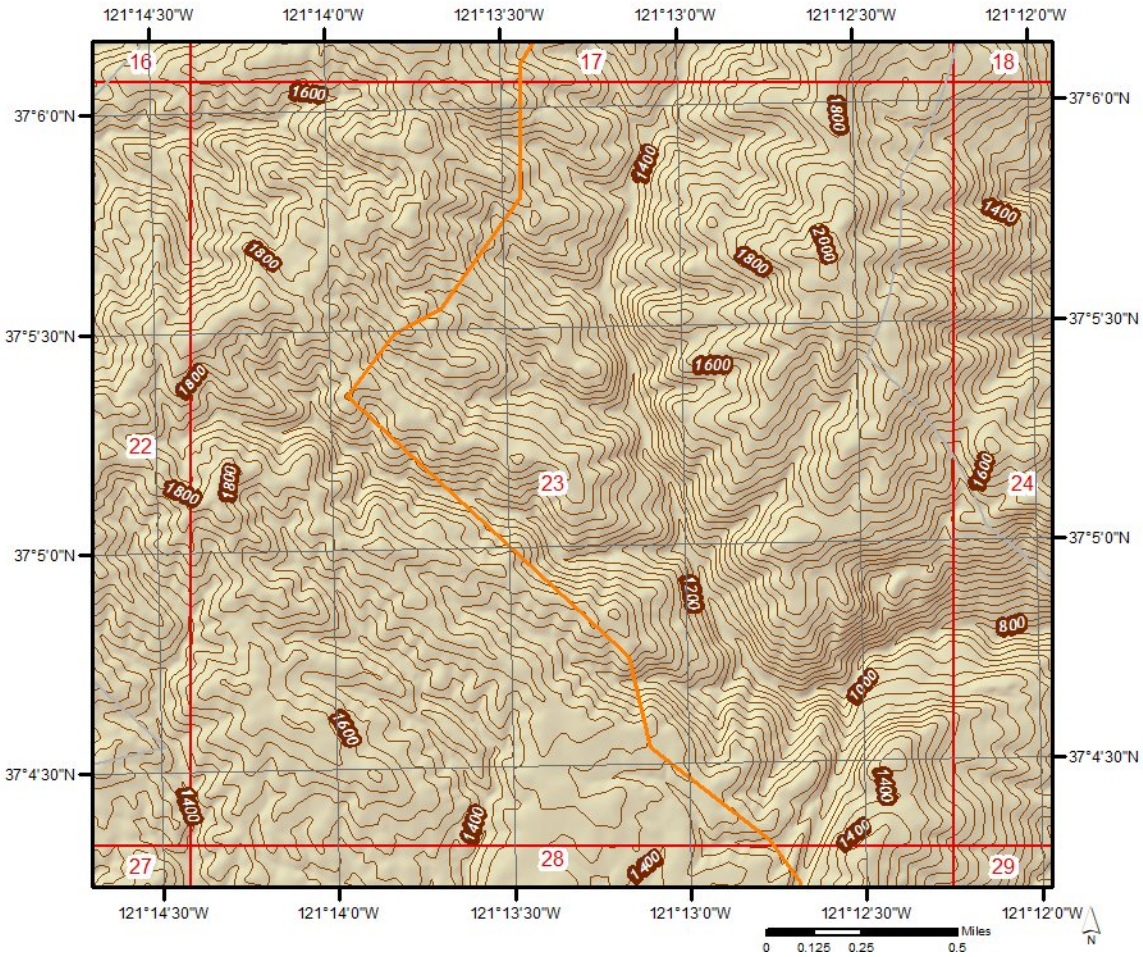

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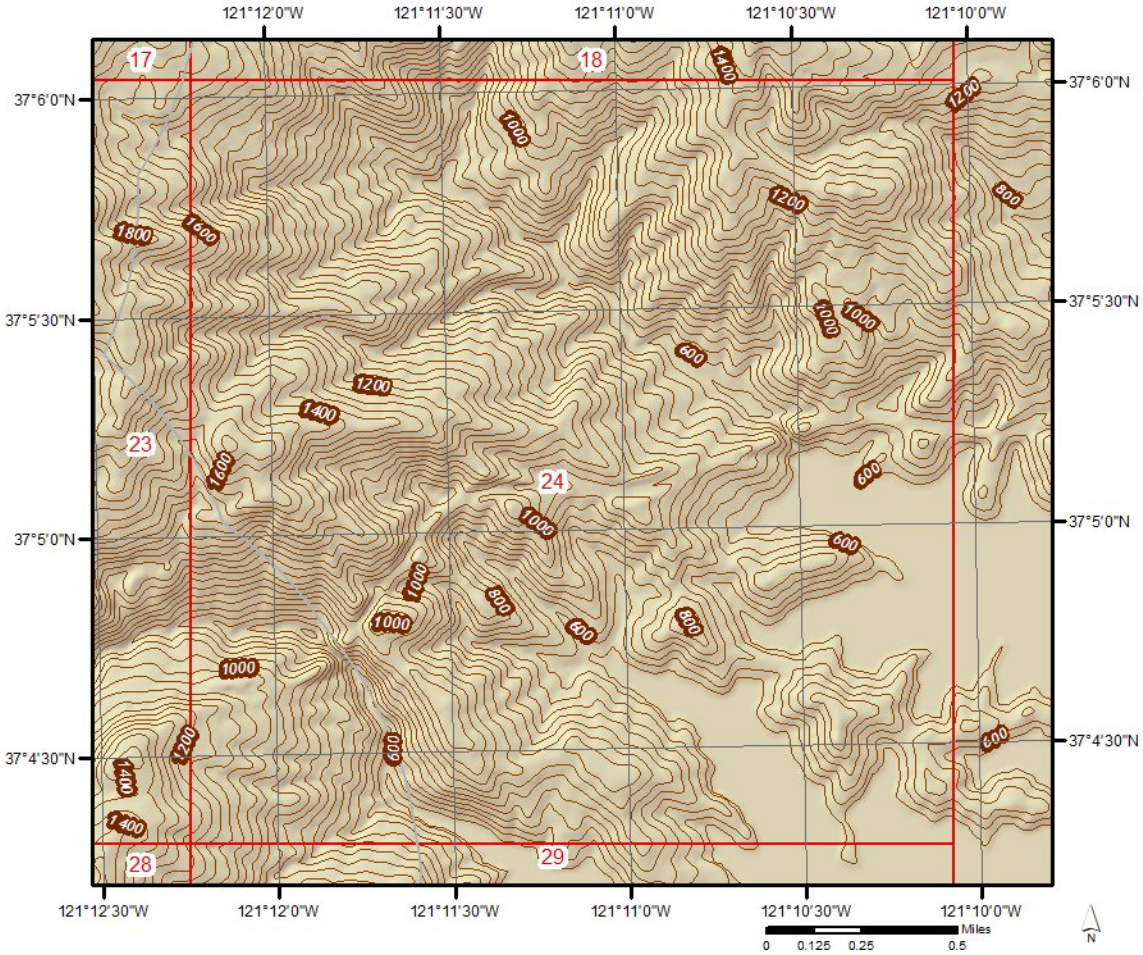

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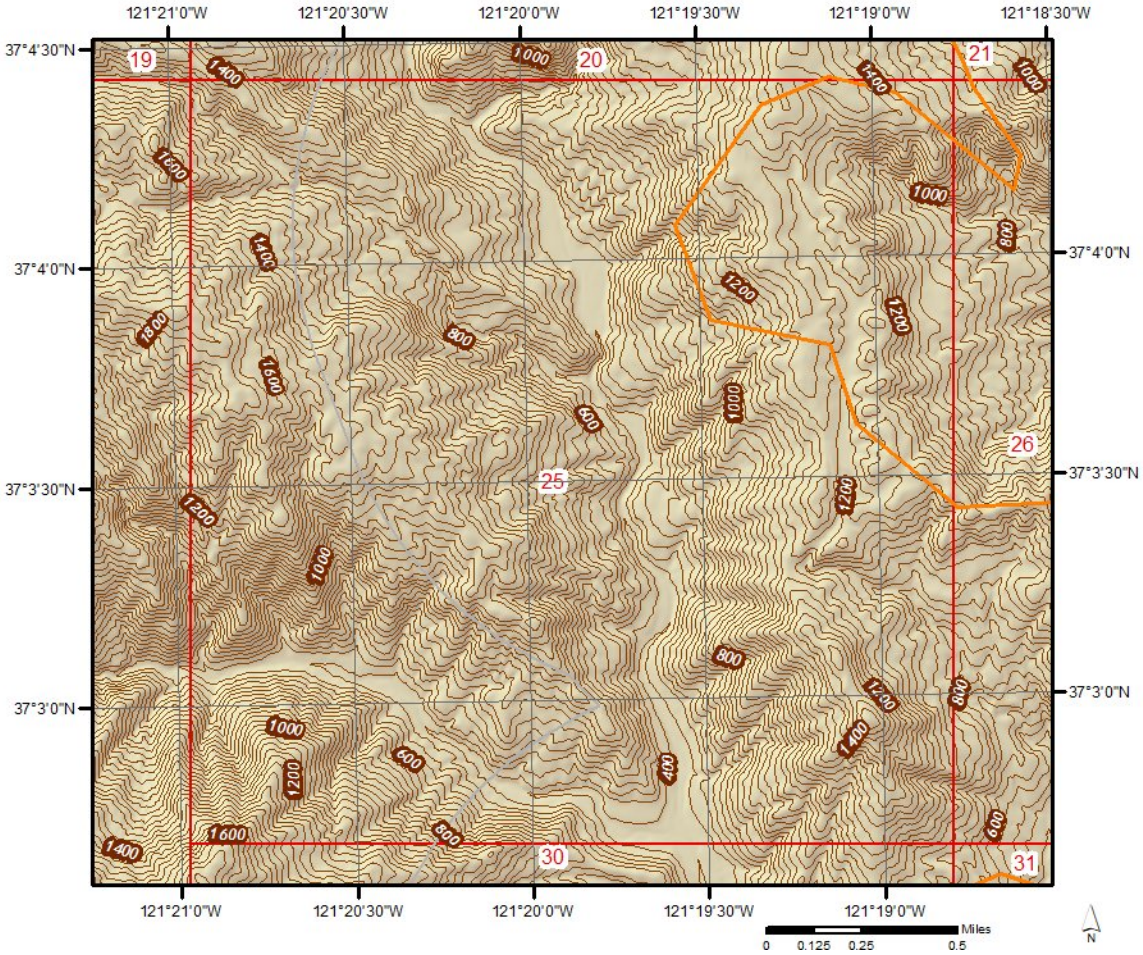

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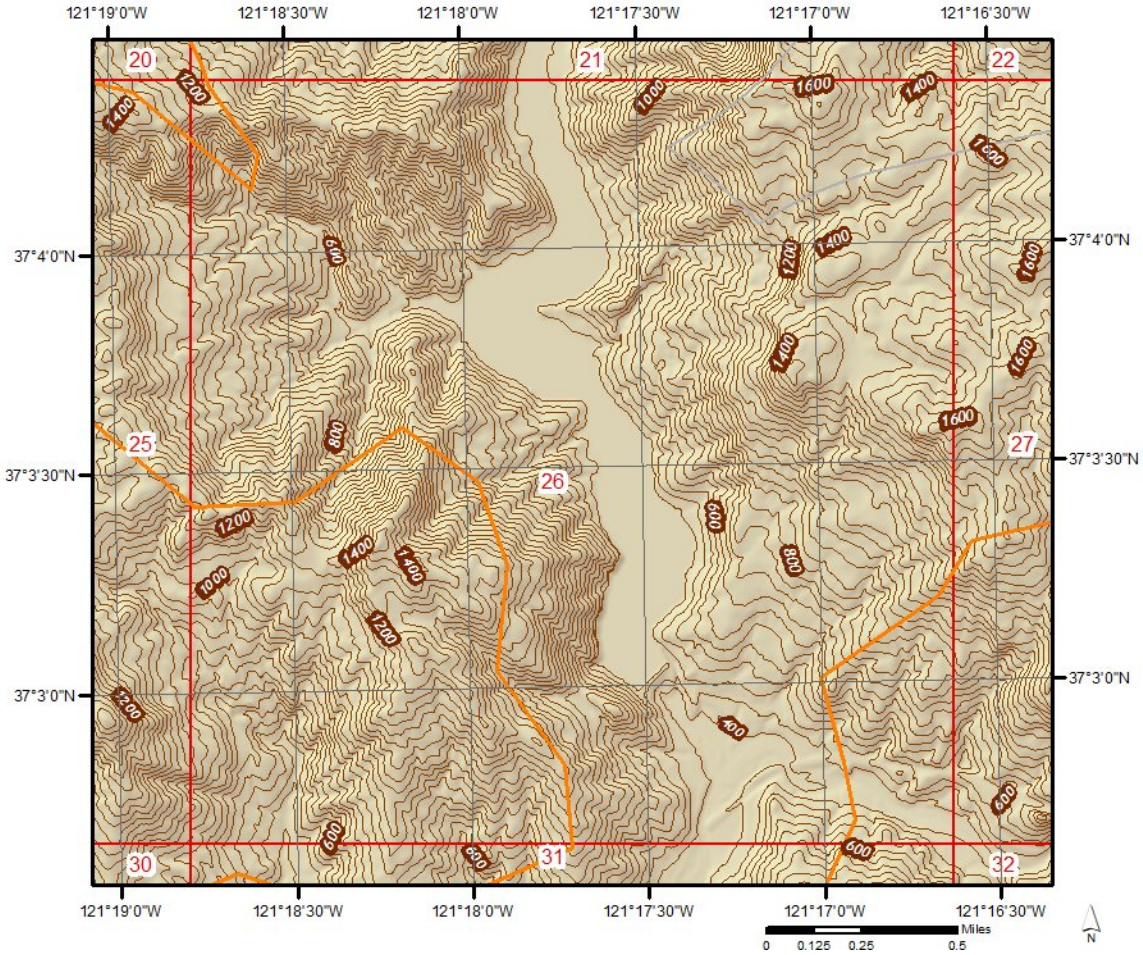

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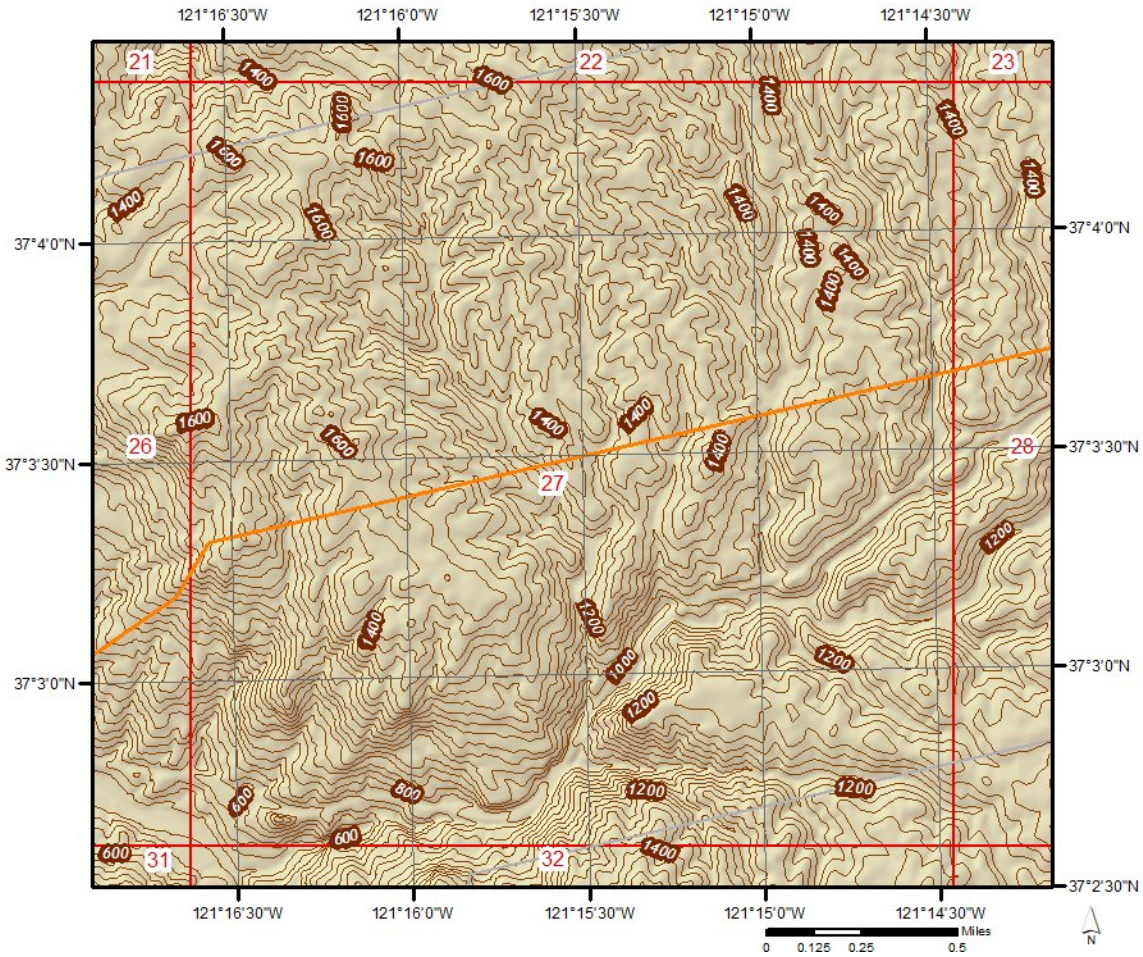

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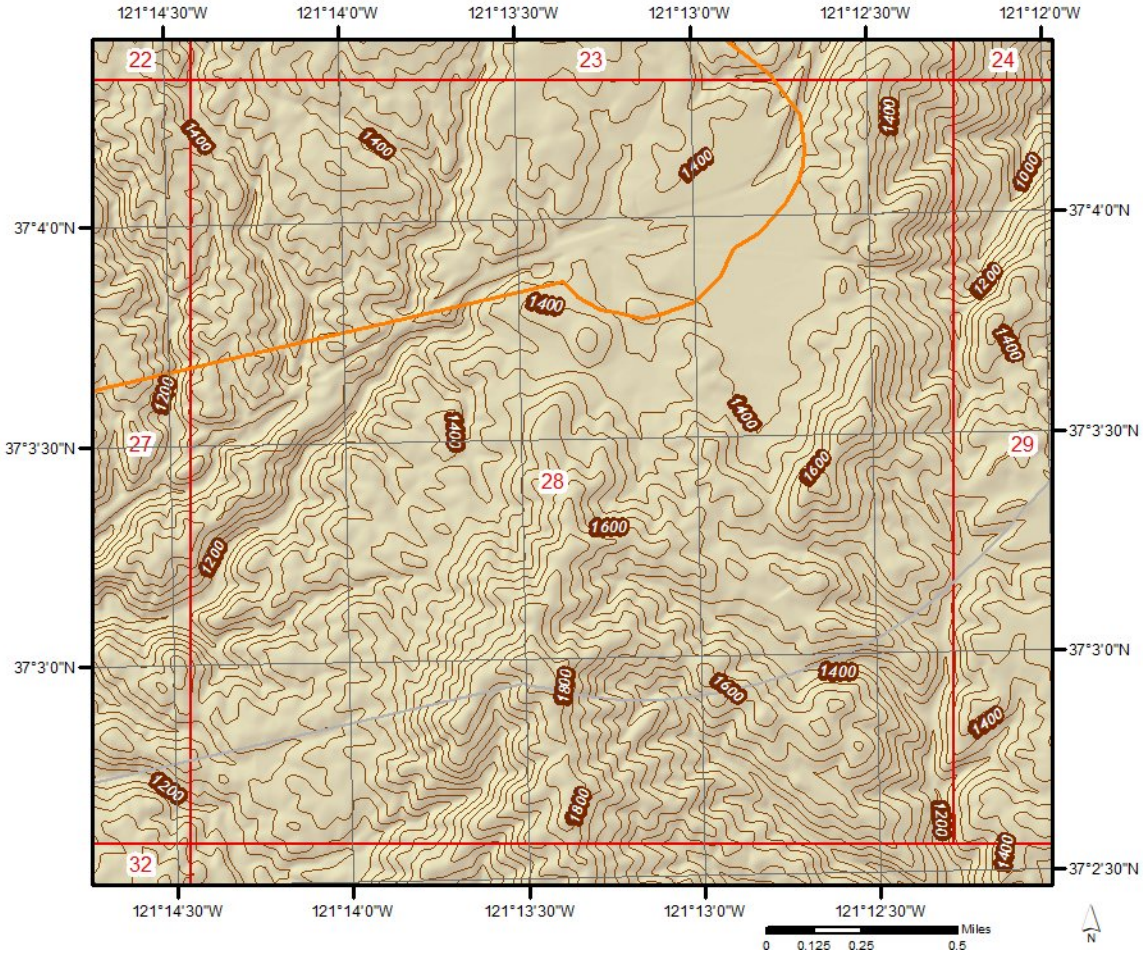

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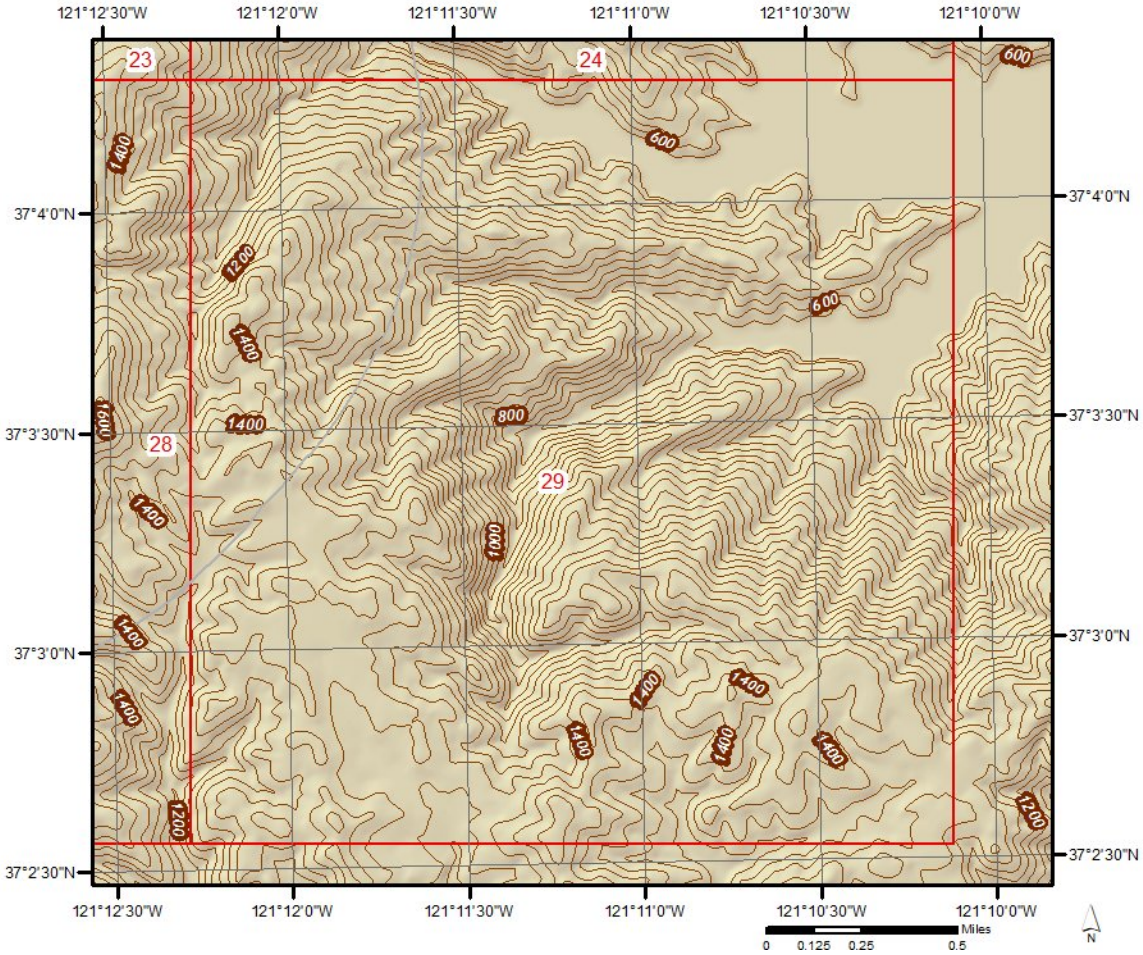

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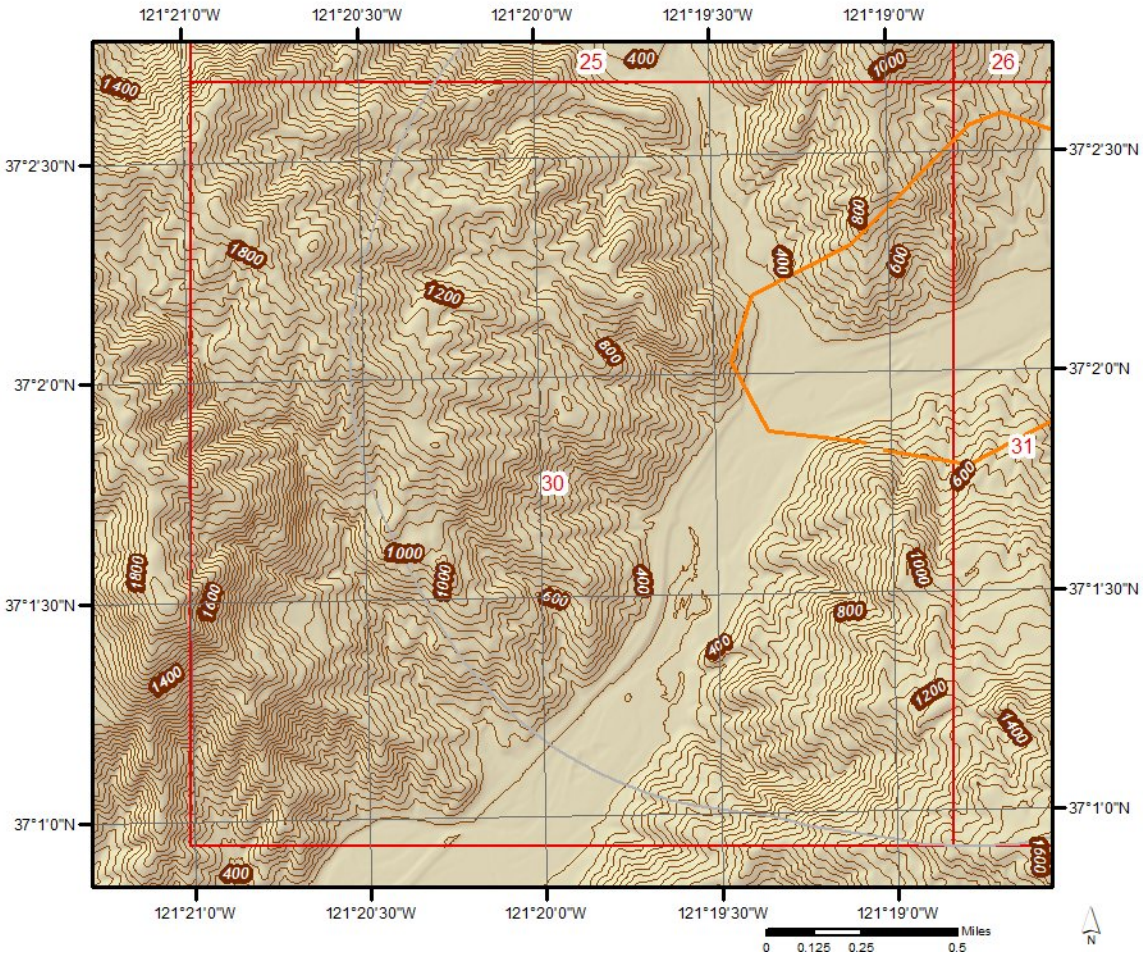

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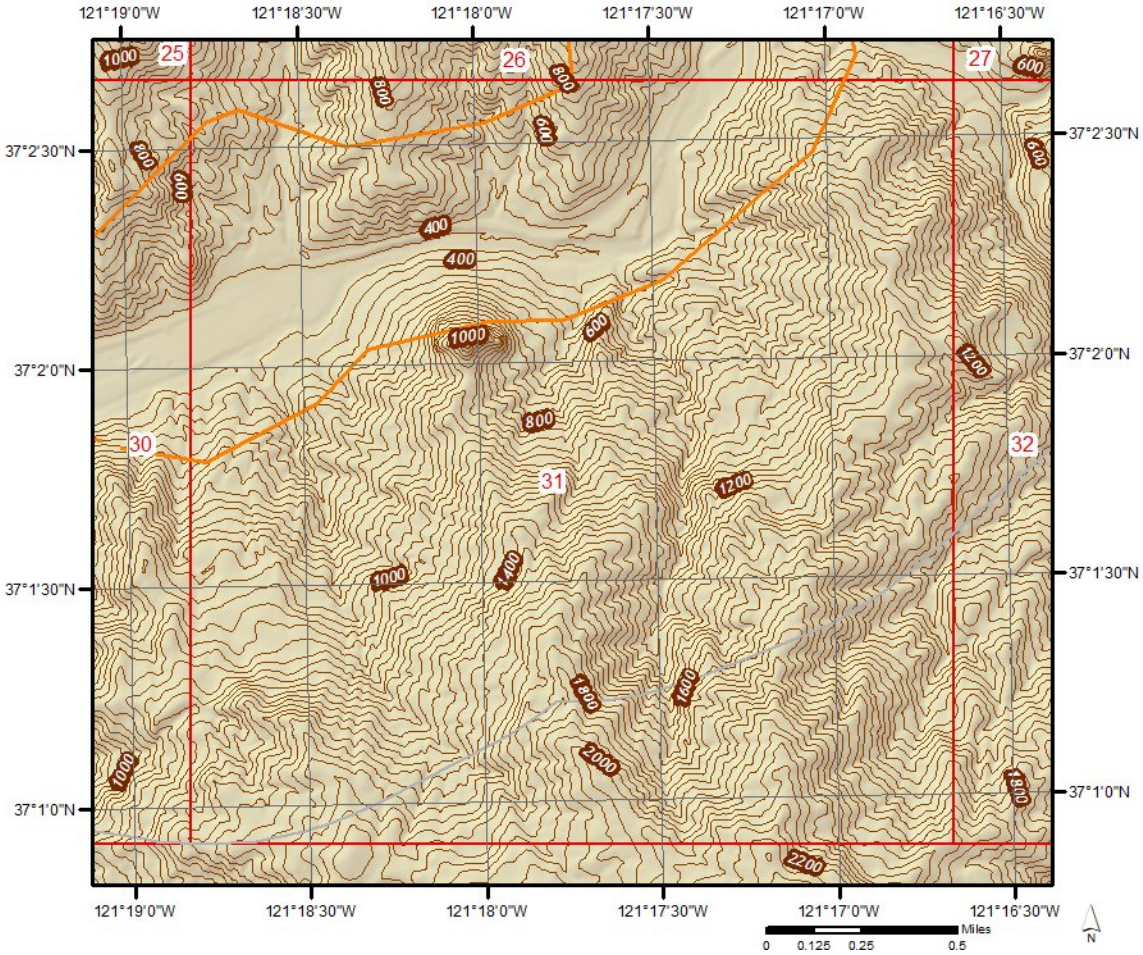

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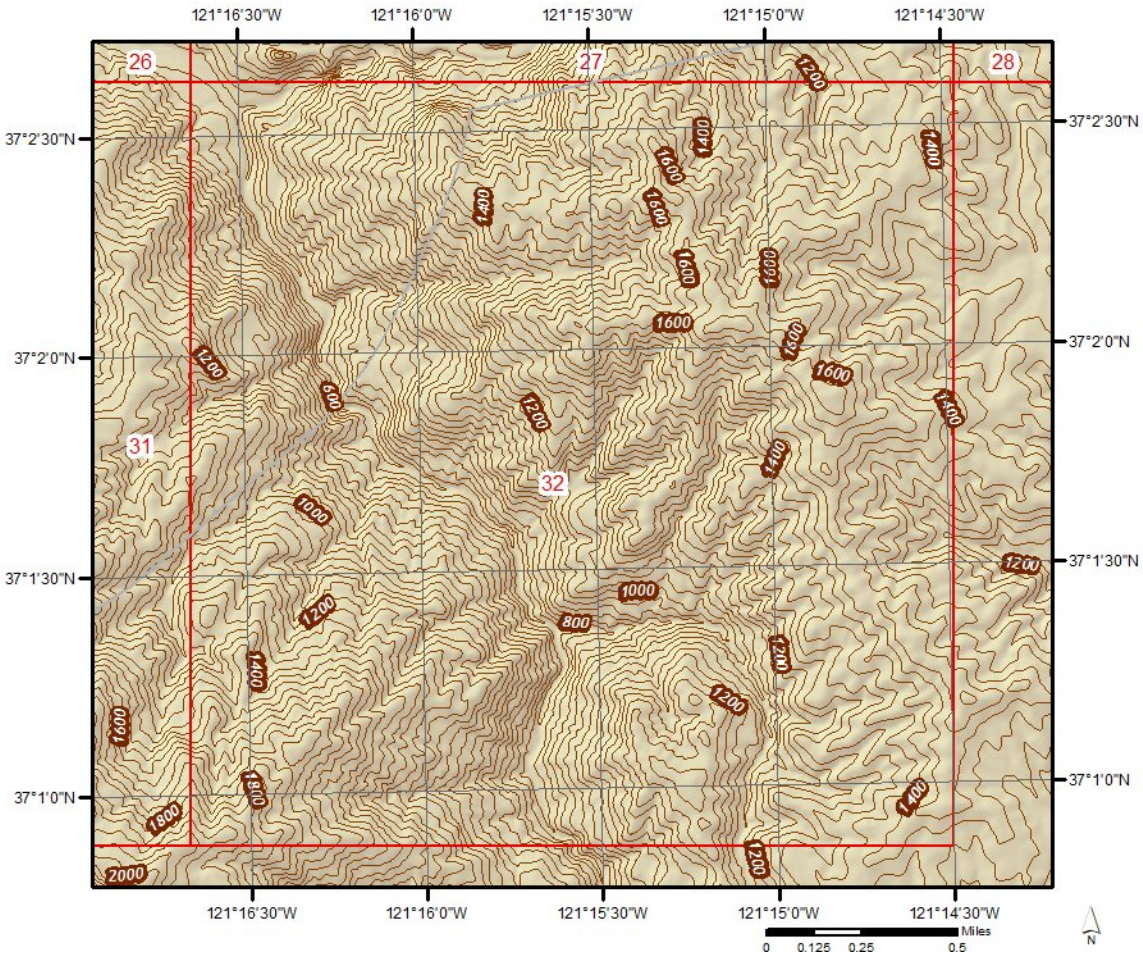
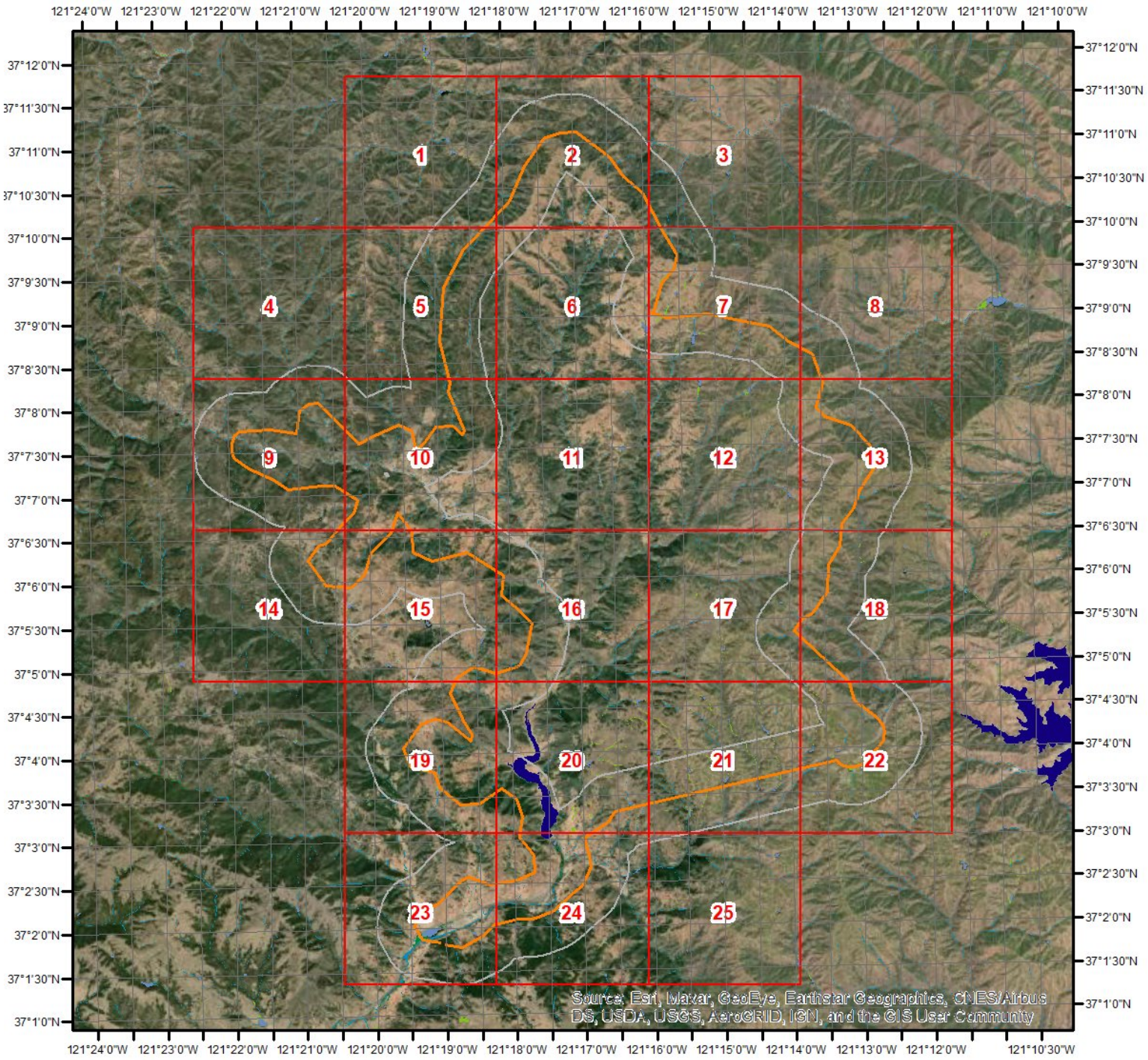
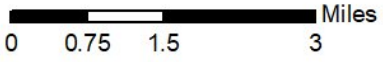


Hydrologic Information



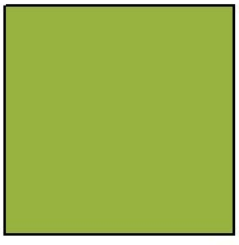
Wetland





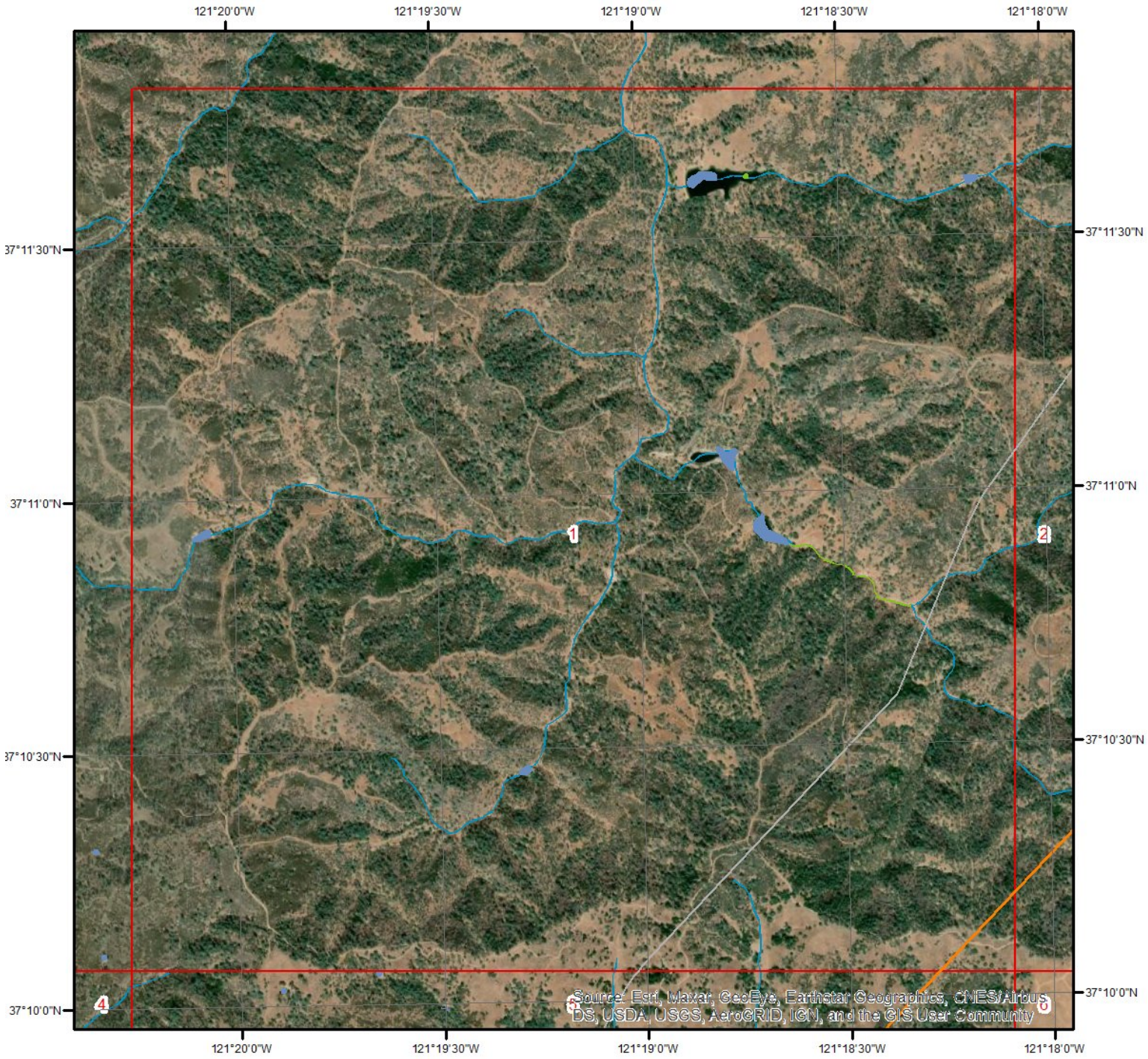
This map shows wetland existence using data from US Fish & Wildlife.
Data coverage is shown to the right. Gray indicates no data available in the area.

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine



ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Wetland Type - Page 1

Miles
0 0.125 0.25 0.5

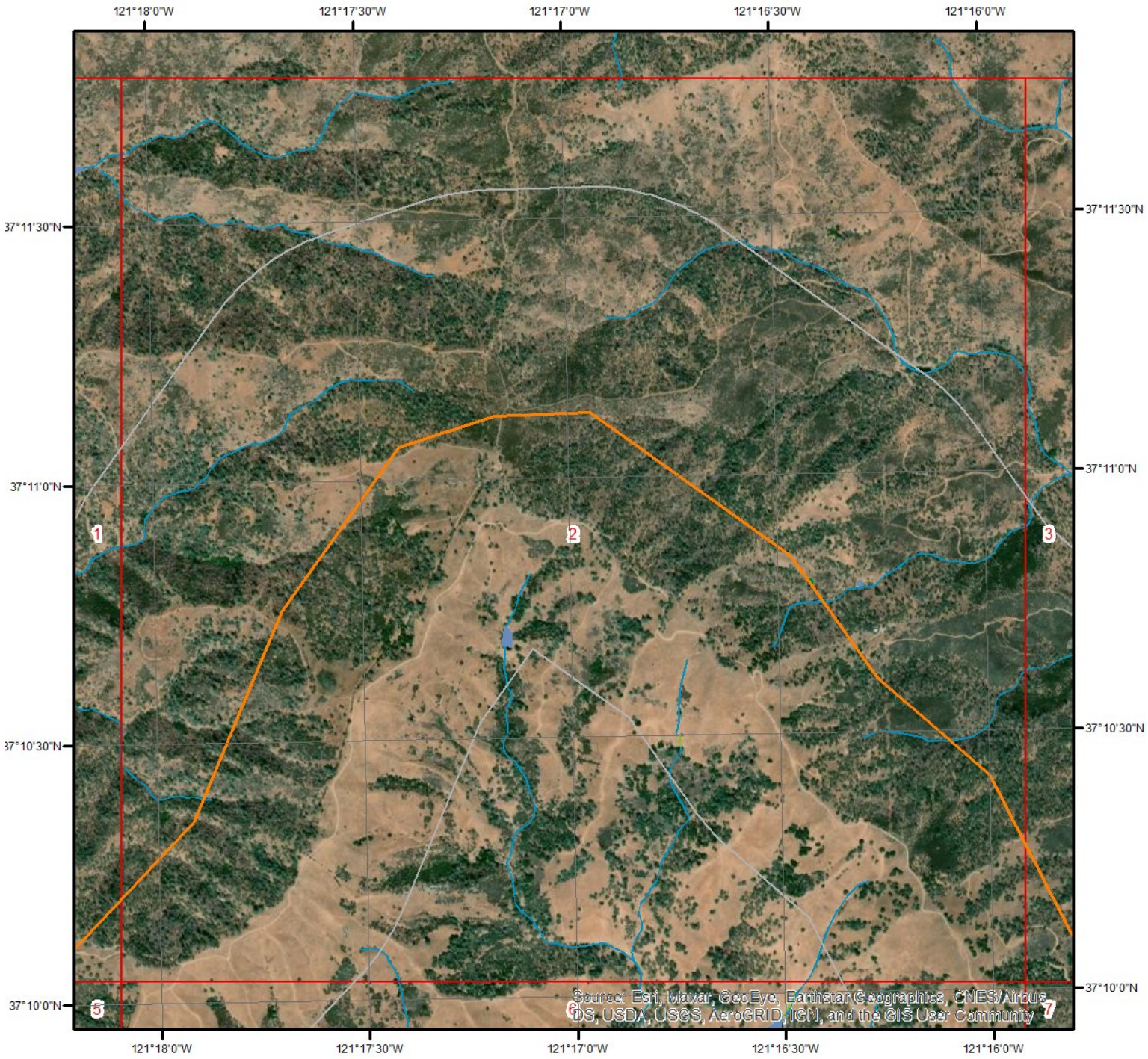
N

This map shows wetland existence using data from US Fish & Wildlife.
Data coverage is shown to the right. Gray indicates no data available in the area.

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Wetland Type - Page 2

0 0.125 0.25 0.5 Miles

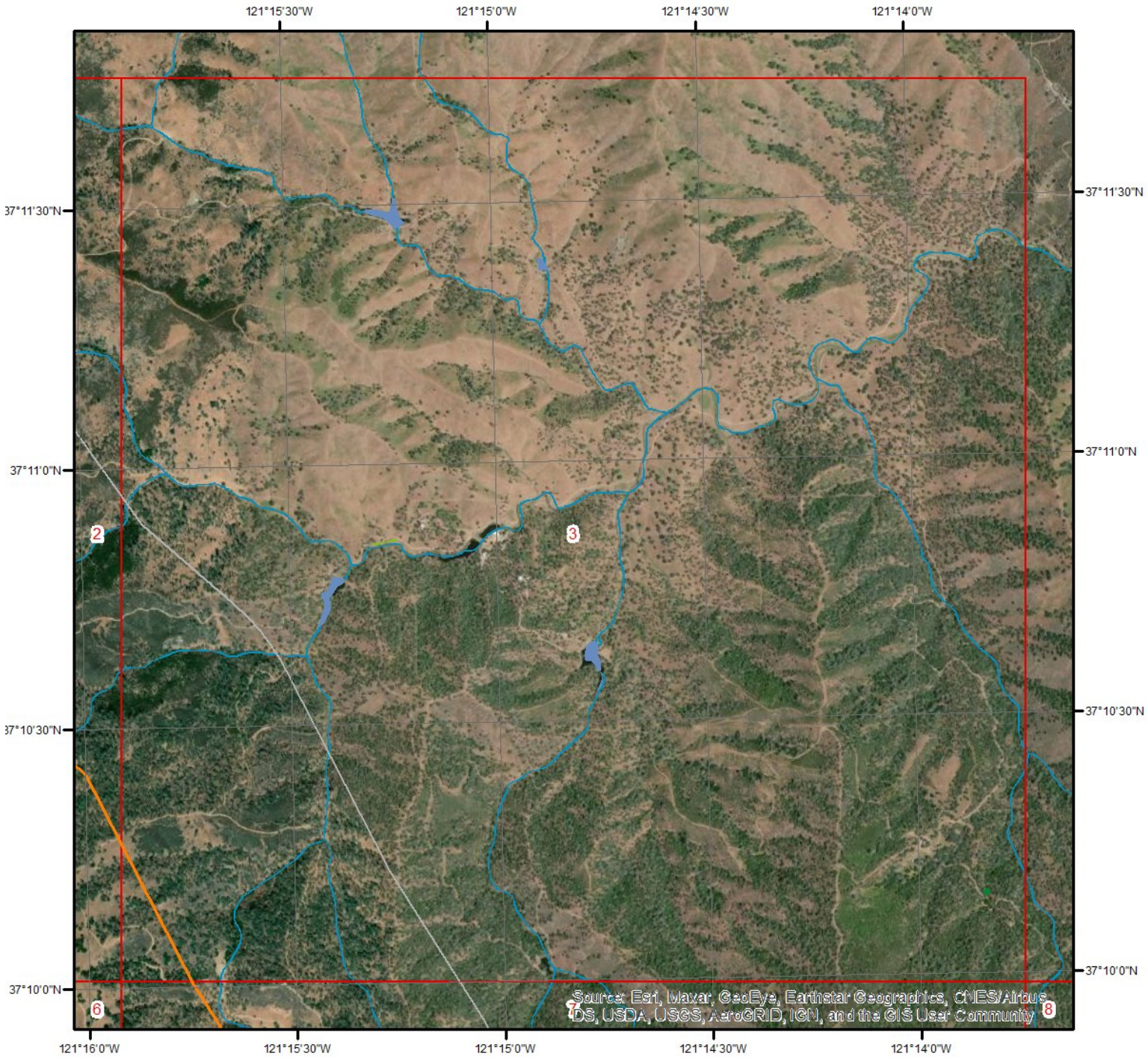
N

This map shows wetland existence using data from US Fish & Wildlife.
Data coverage is shown to the right. Gray indicates no data available in the area.

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Wetland Type - Page 3

0 0.125 0.25 0.5 Miles

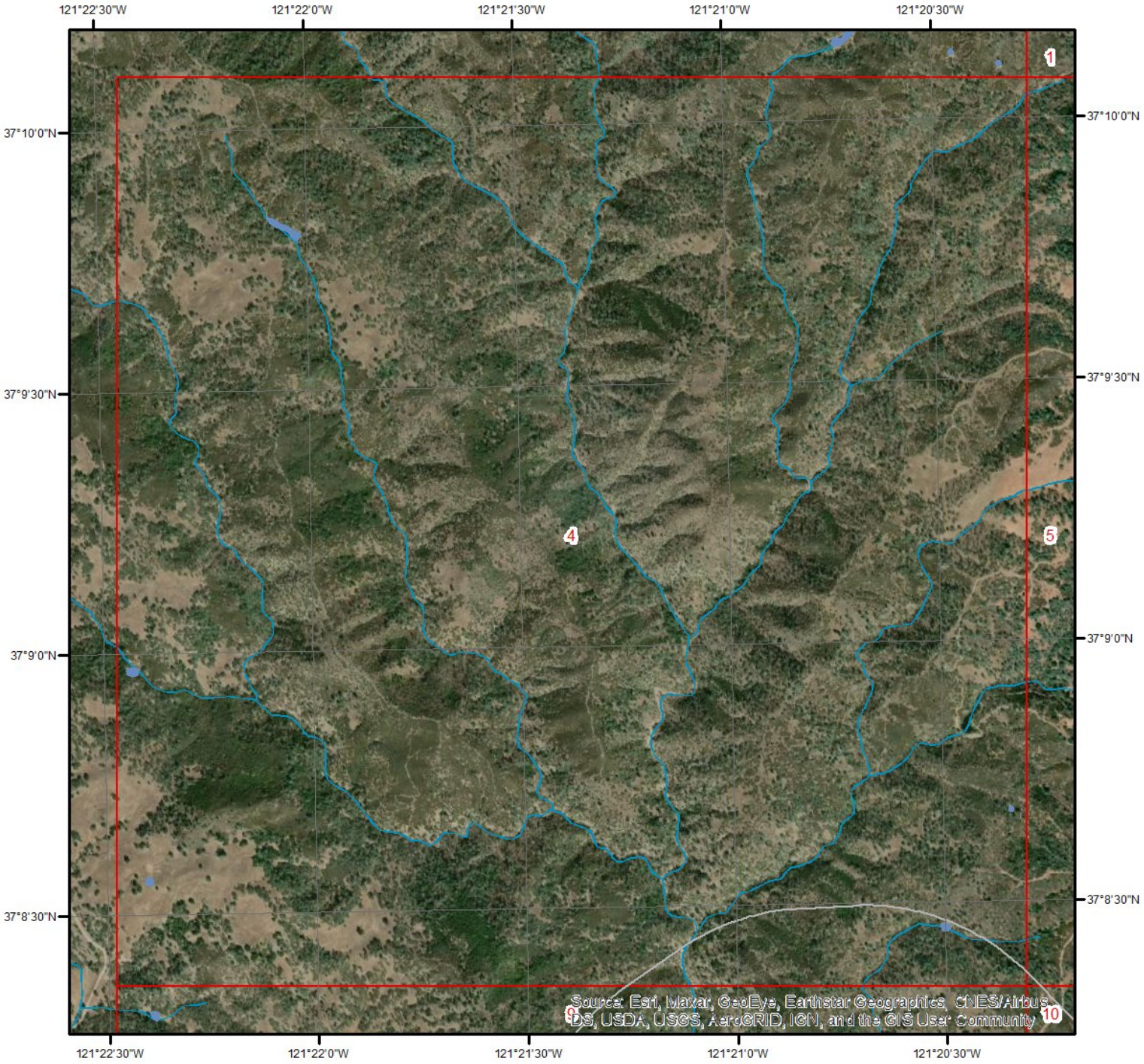
N

This map shows wetland existence using data from US Fish & Wildlife.
Data coverage is shown to the right. Gray indicates no data available in the area.

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Wetland Type - Page 4

0 0.125 0.25 0.5 Miles

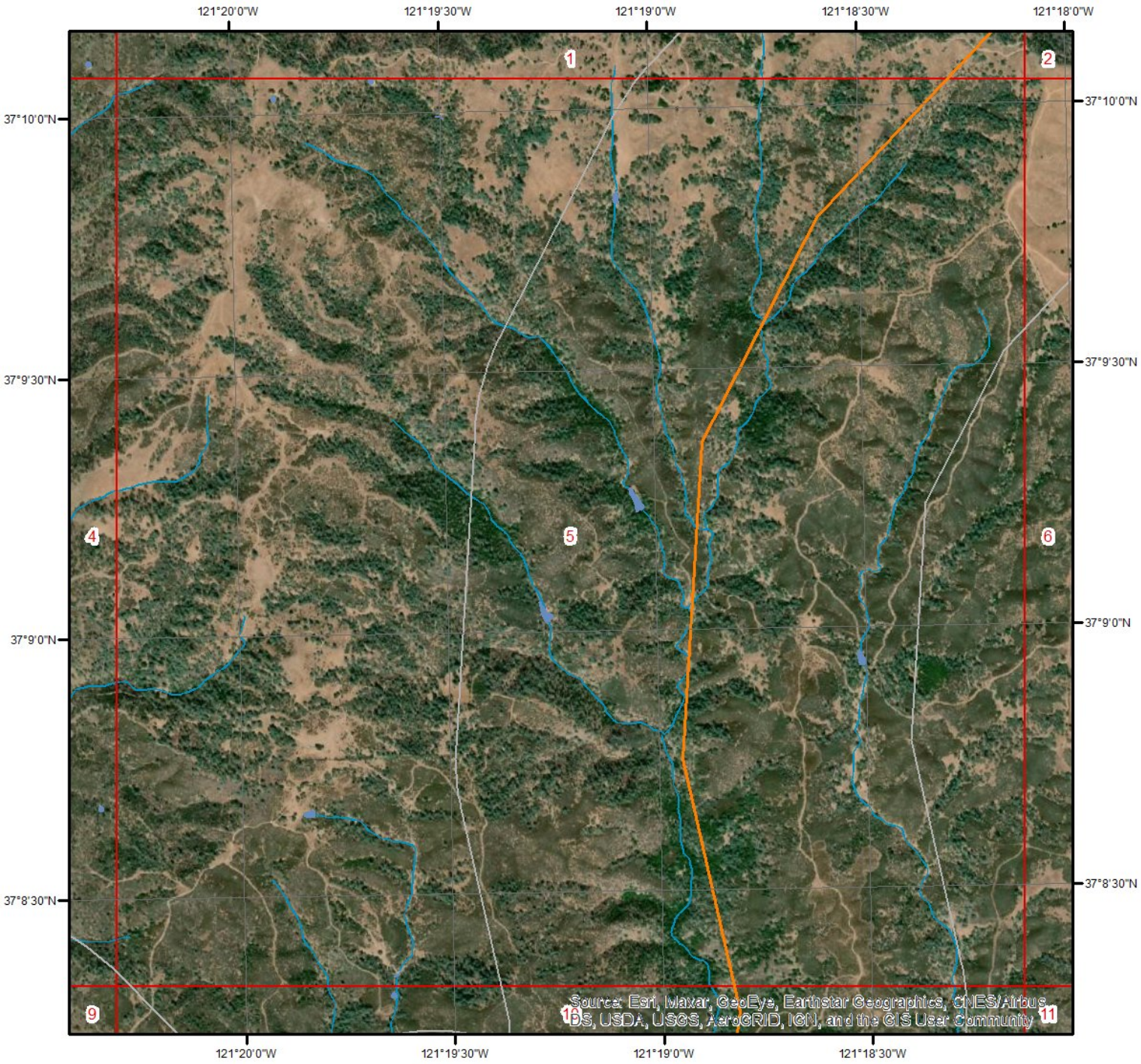
N

This map shows wetland existence using data from US Fish & Wildlife.
Data coverage is shown to the right. Gray indicates no data available in the area.

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Wetland Type - Page 5

0 0.125 0.25 0.5 Miles

N

This map shows wetland existence using data from US Fish & Wildlife.
Data coverage is shown to the right. Gray indicates no data available in the area.

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

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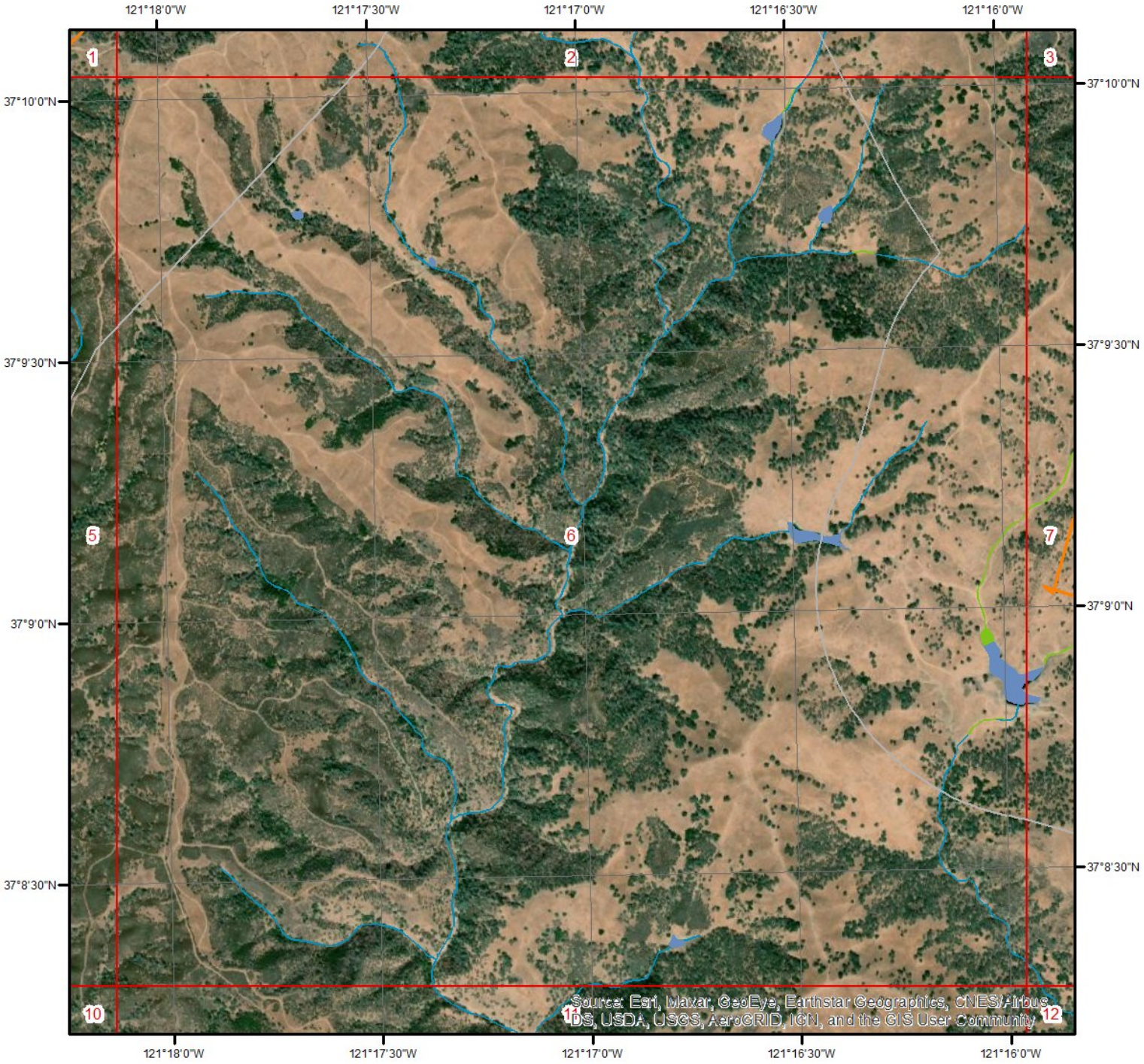
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Wetland Type - Page 6

0 0.125 0.25 0.5 Miles

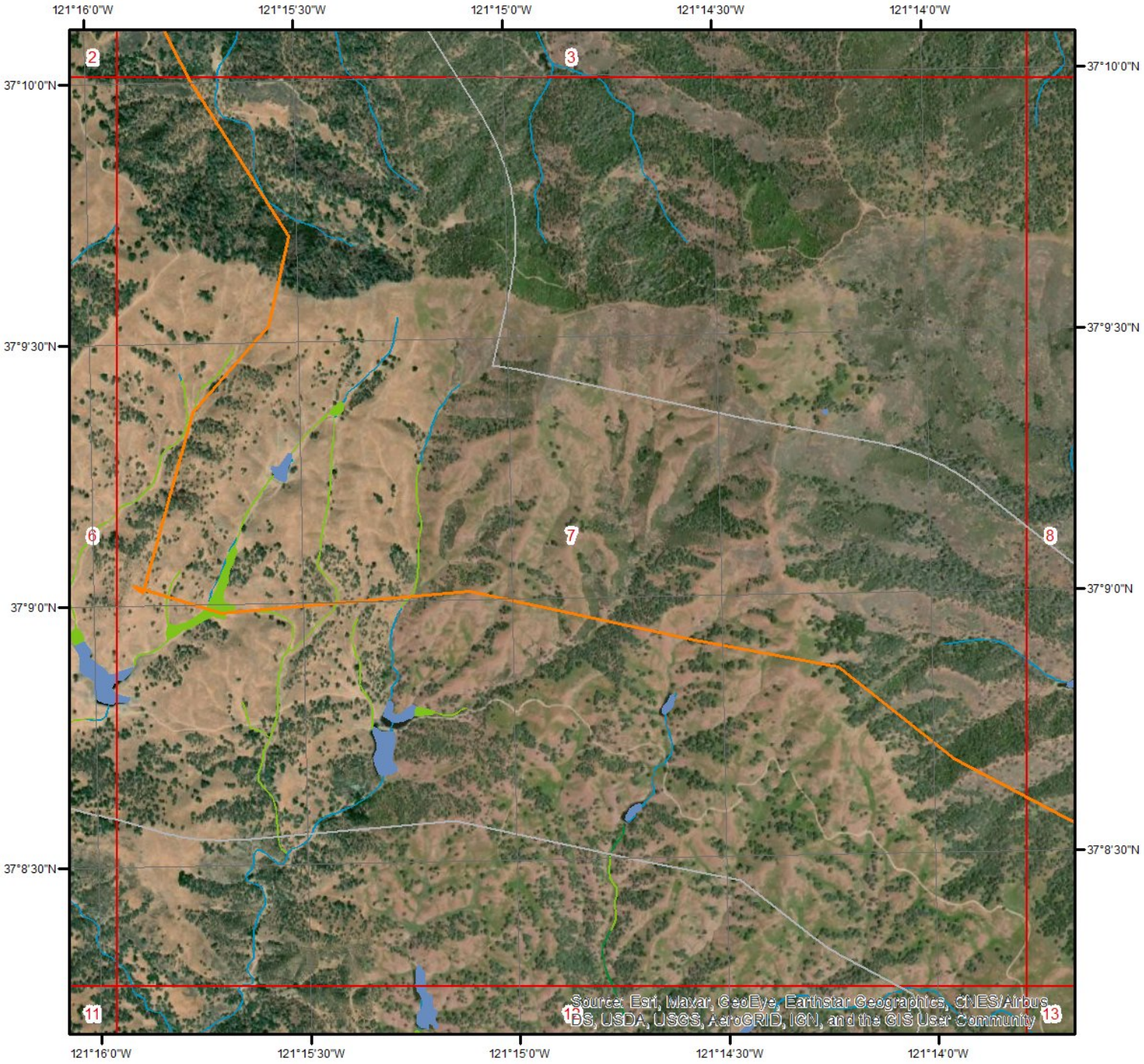
N

This map shows wetland existence using data from US Fish & Wildlife.
Data coverage is shown to the right. Gray indicates no data available in the area.

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Wetland Type - Page 7

0 0.125 0.25 0.5 Miles

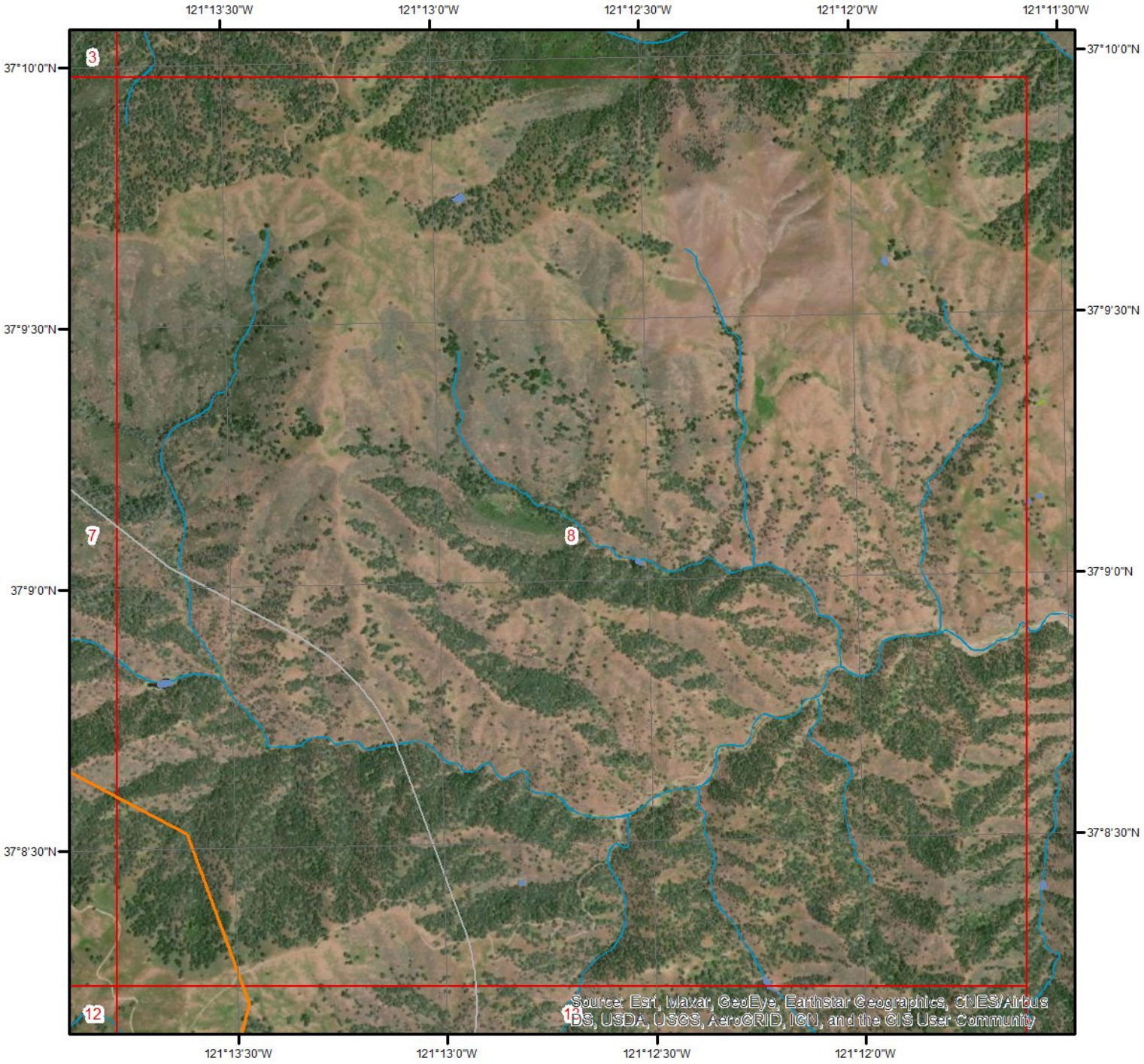
N

This map shows wetland existence using data from US Fish & Wildlife.
Data coverage is shown to the right. Gray indicates no data available in the area.

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Wetland Type - Page 8

0 0.125 0.25 0.5 Miles

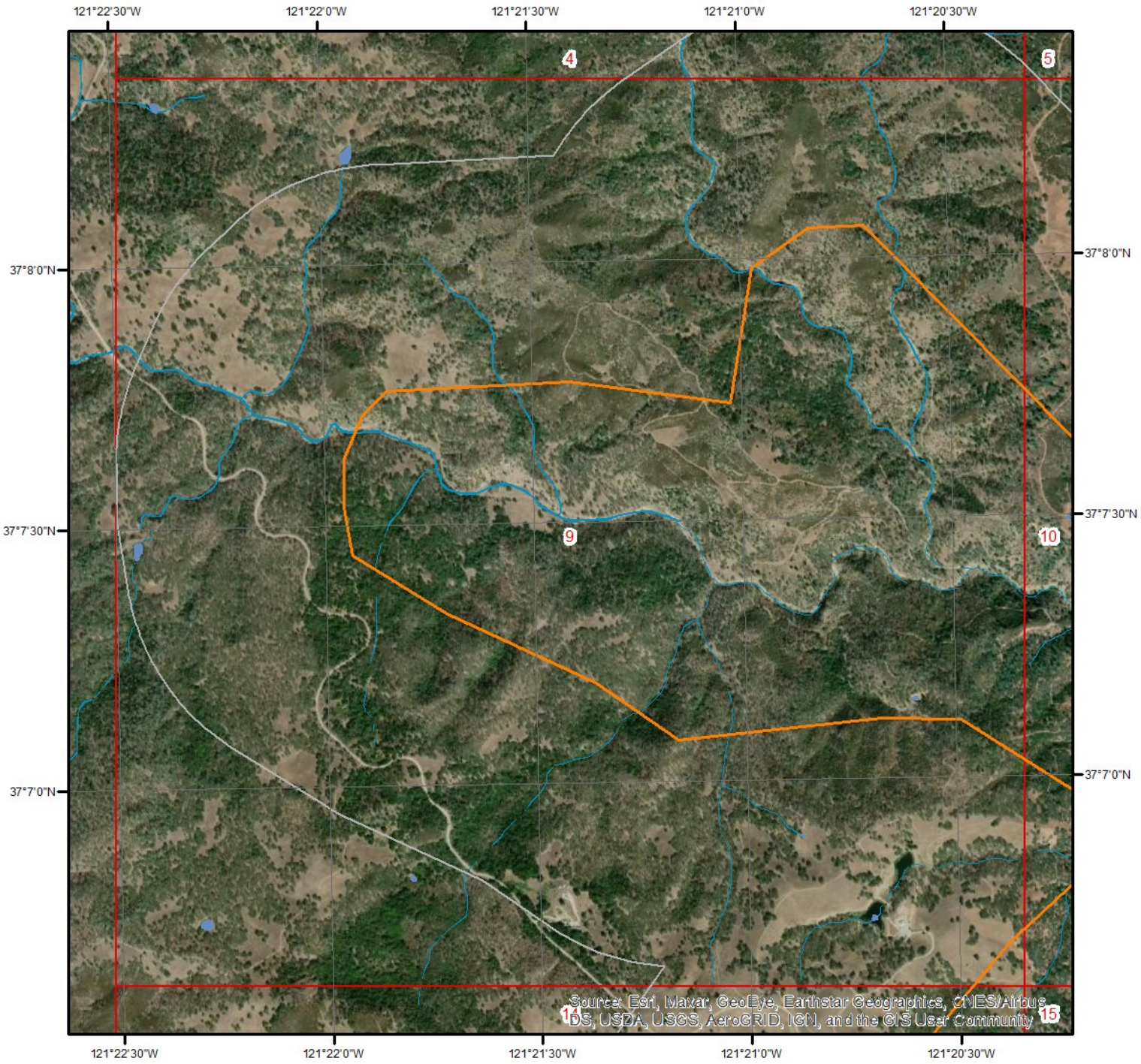
N

This map shows wetland existence using data from US Fish & Wildlife.
Data coverage is shown to the right. Gray indicates no data available in the area.

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Wetland Type - Page 9

0 0.125 0.25 0.5 Miles

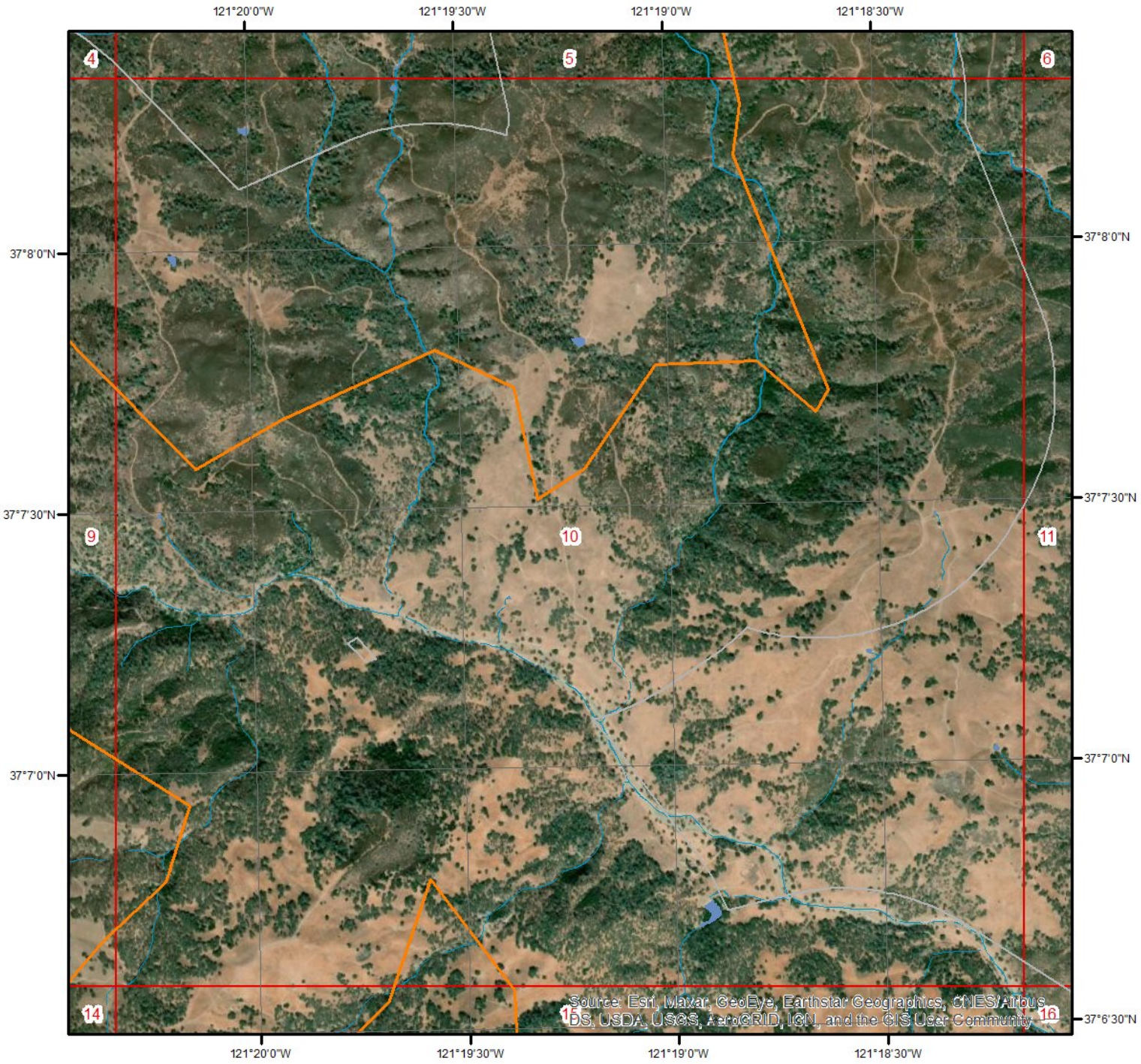
N

This map shows wetland existence using data from US Fish & Wildlife.
Data coverage is shown to the right. Gray indicates no data available in the area.

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Wetland Type - Page 10

0 0.125 0.25 0.5 Miles

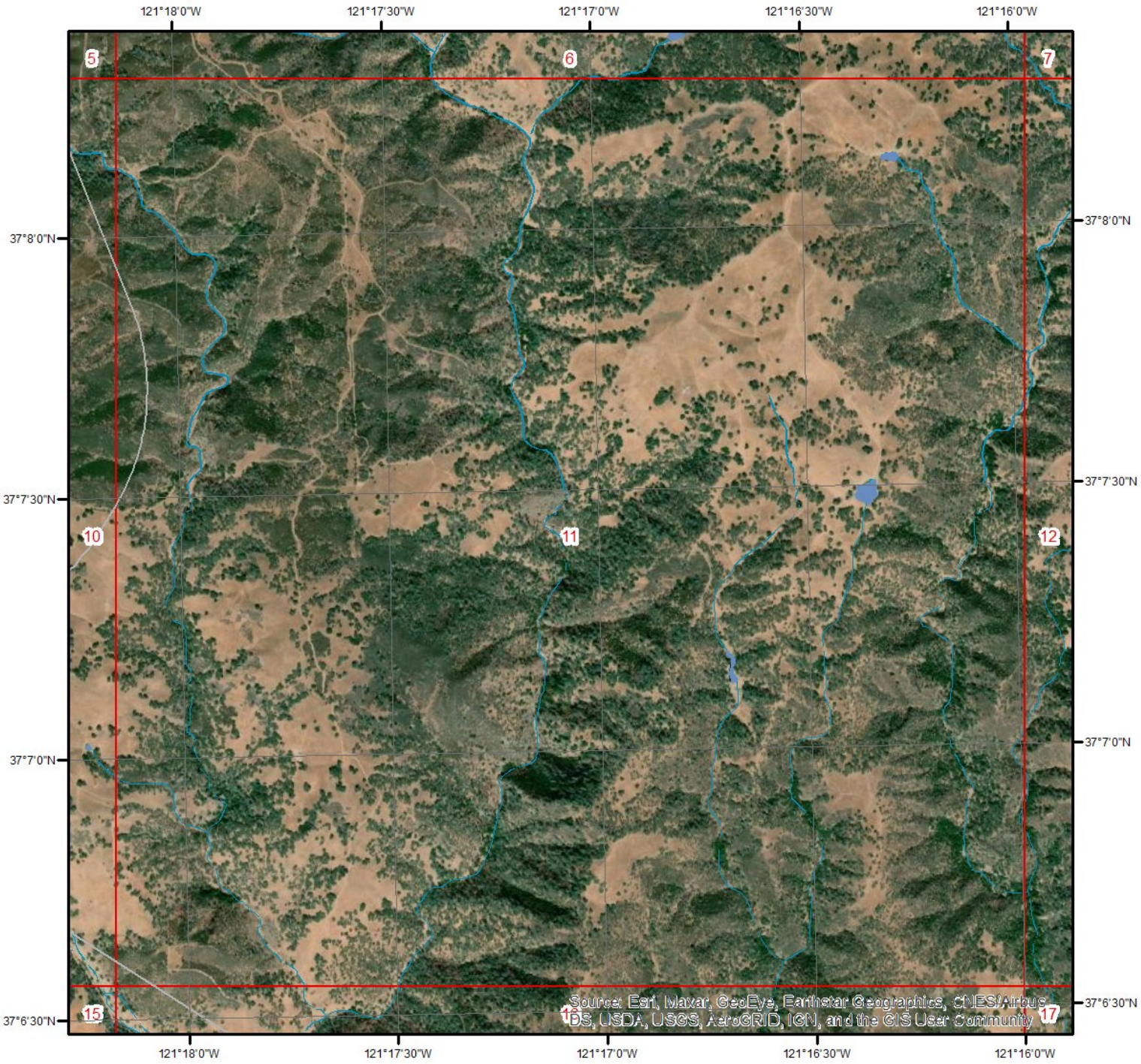
N

This map shows wetland existence using data from US Fish & Wildlife.
Data coverage is shown to the right. Gray indicates no data available in the area.

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Wetland Type - Page 11

0 0.125 0.25 0.5 Miles

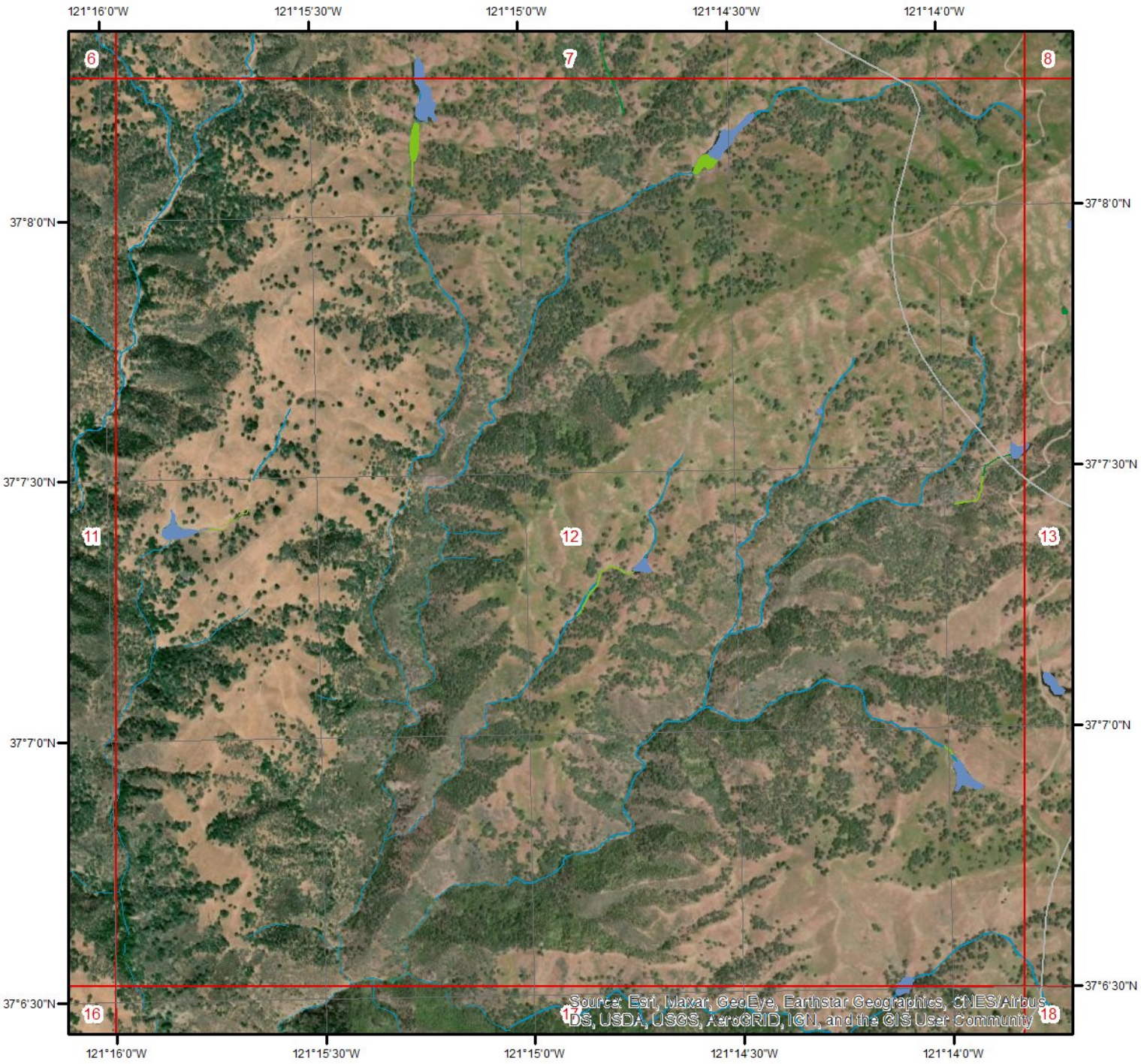
N

This map shows wetland existence using data from US Fish & Wildlife.
Data coverage is shown to the right. Gray indicates no data available in the area.

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Wetland Type - Page 12

0 0.125 0.25 0.5 Miles

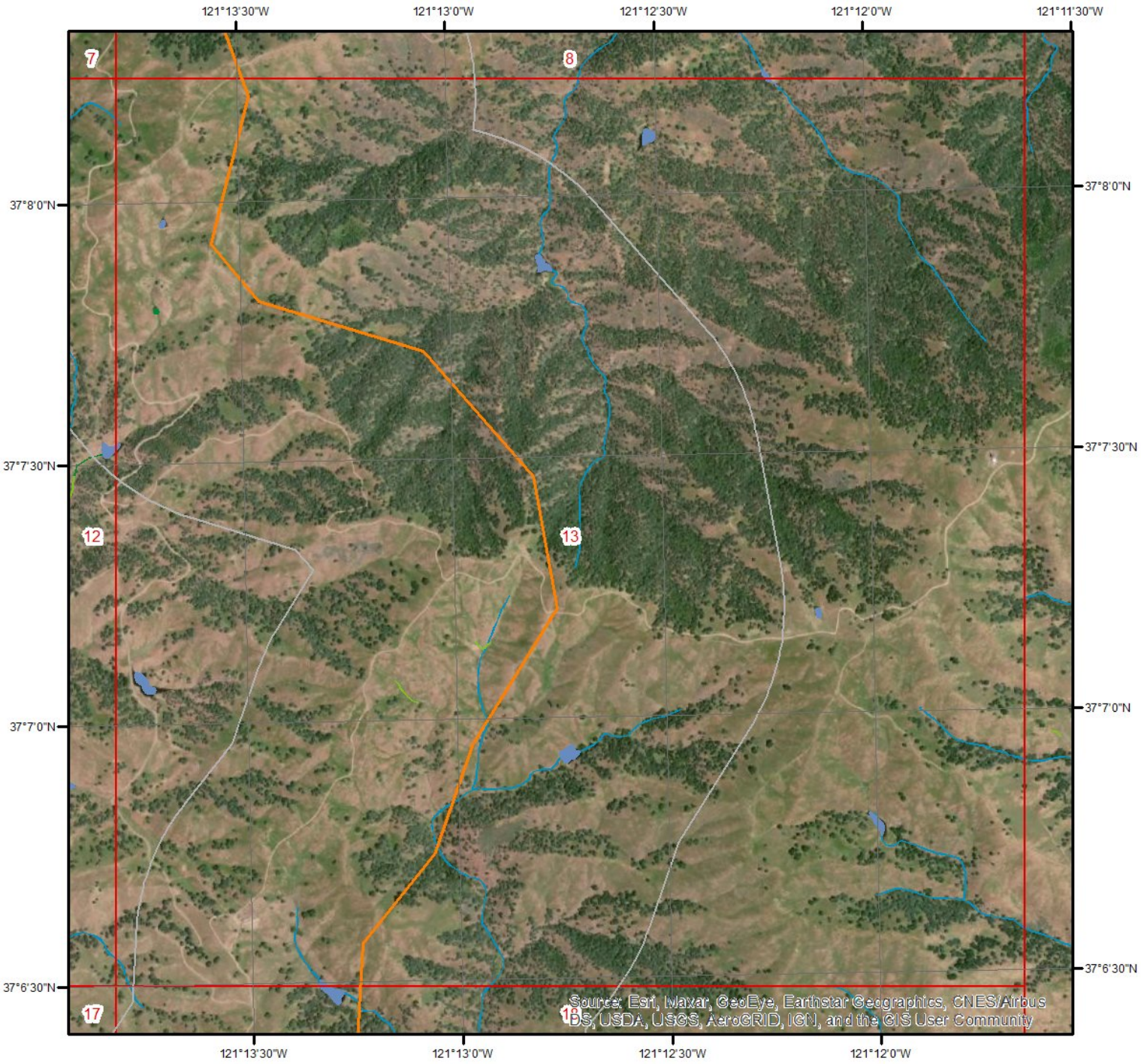
N

This map shows wetland existence using data from US Fish & Wildlife.
Data coverage is shown to the right. Gray indicates no data available in the area.

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Wetland Type - Page 13

0 0.125 0.25 0.5 Miles

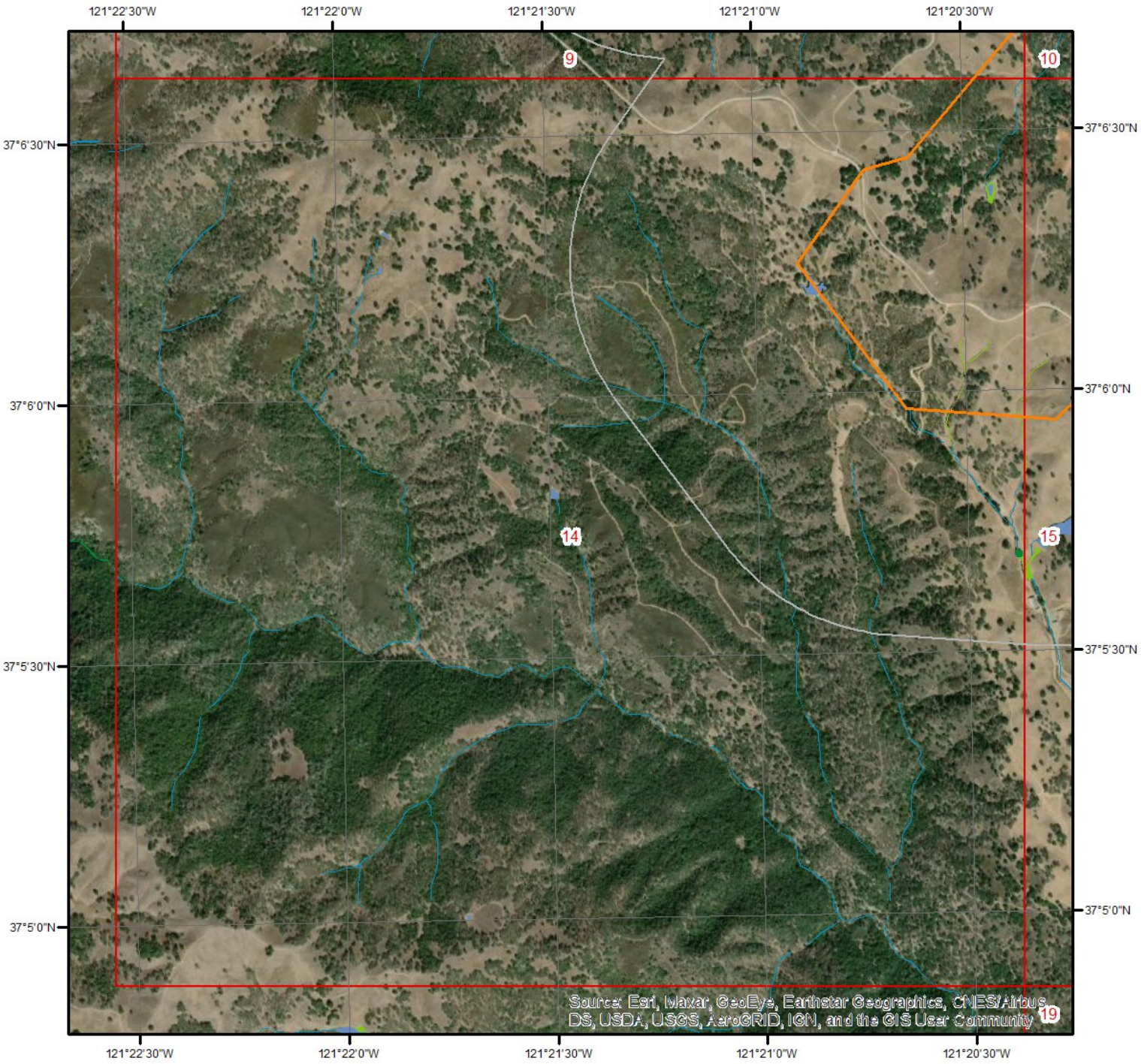
N

This map shows wetland existence using data from US Fish & Wildlife.
Data coverage is shown to the right. Gray indicates no data available in the area.

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Wetland Type - Page 14

0 0.125 0.25 0.5 Miles

N

This map shows wetland existence using data from US Fish & Wildlife.
Data coverage is shown to the right. Gray indicates no data available in the area.

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Wetland Type - Page 15

Miles
0 0.125 0.25 0.5

N

This map shows wetland existence using data from US Fish & Wildlife.
Data coverage is shown to the right. Gray indicates no data available in the area.

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Wetland Type - Page 16

0 0.125 0.25 0.5 Miles

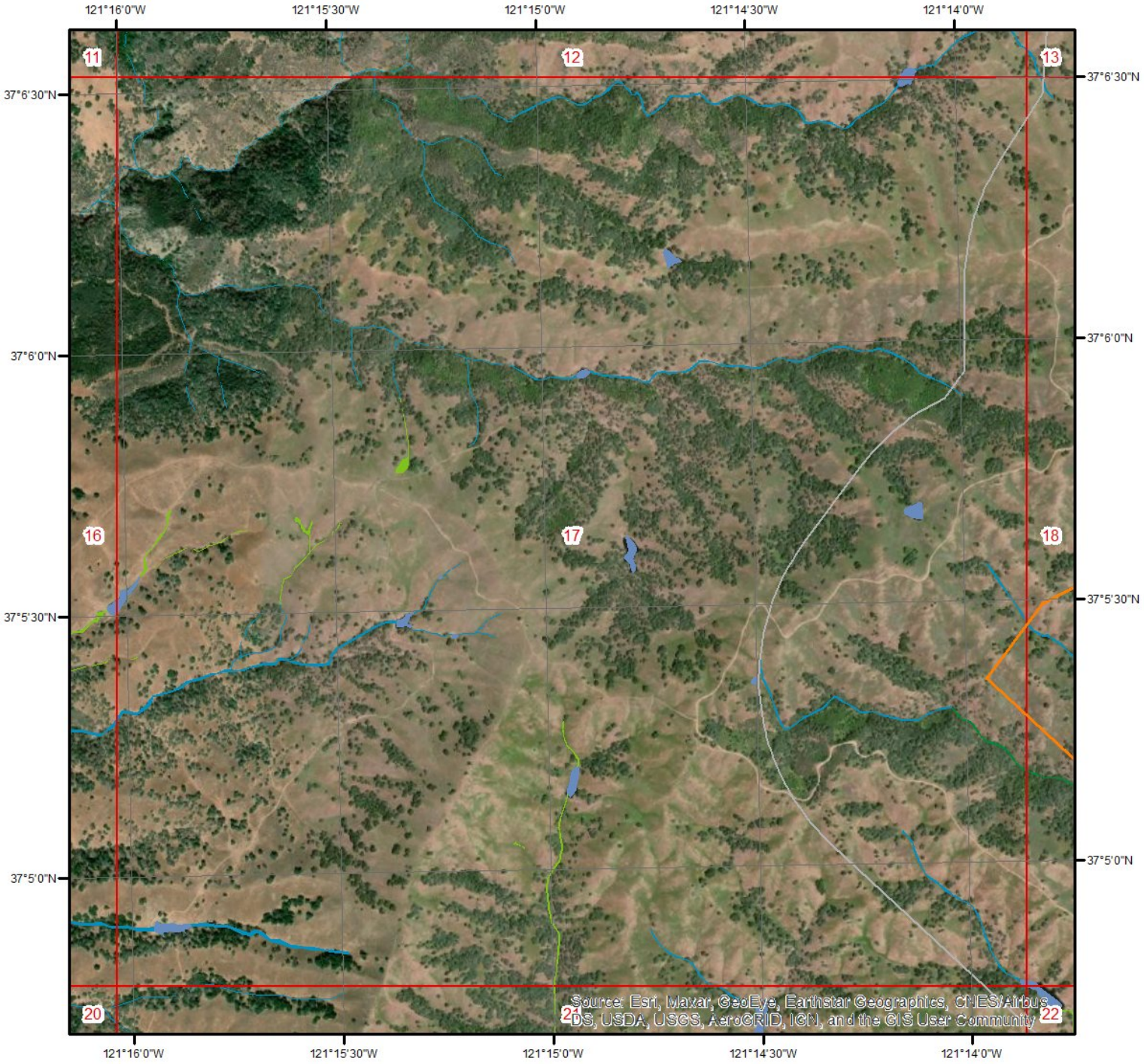
N

This map shows wetland existence using data from US Fish & Wildlife.
Data coverage is shown to the right. Gray indicates no data available in the area.

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Wetland Type - Page 17

0 0.125 0.25 0.5 Miles

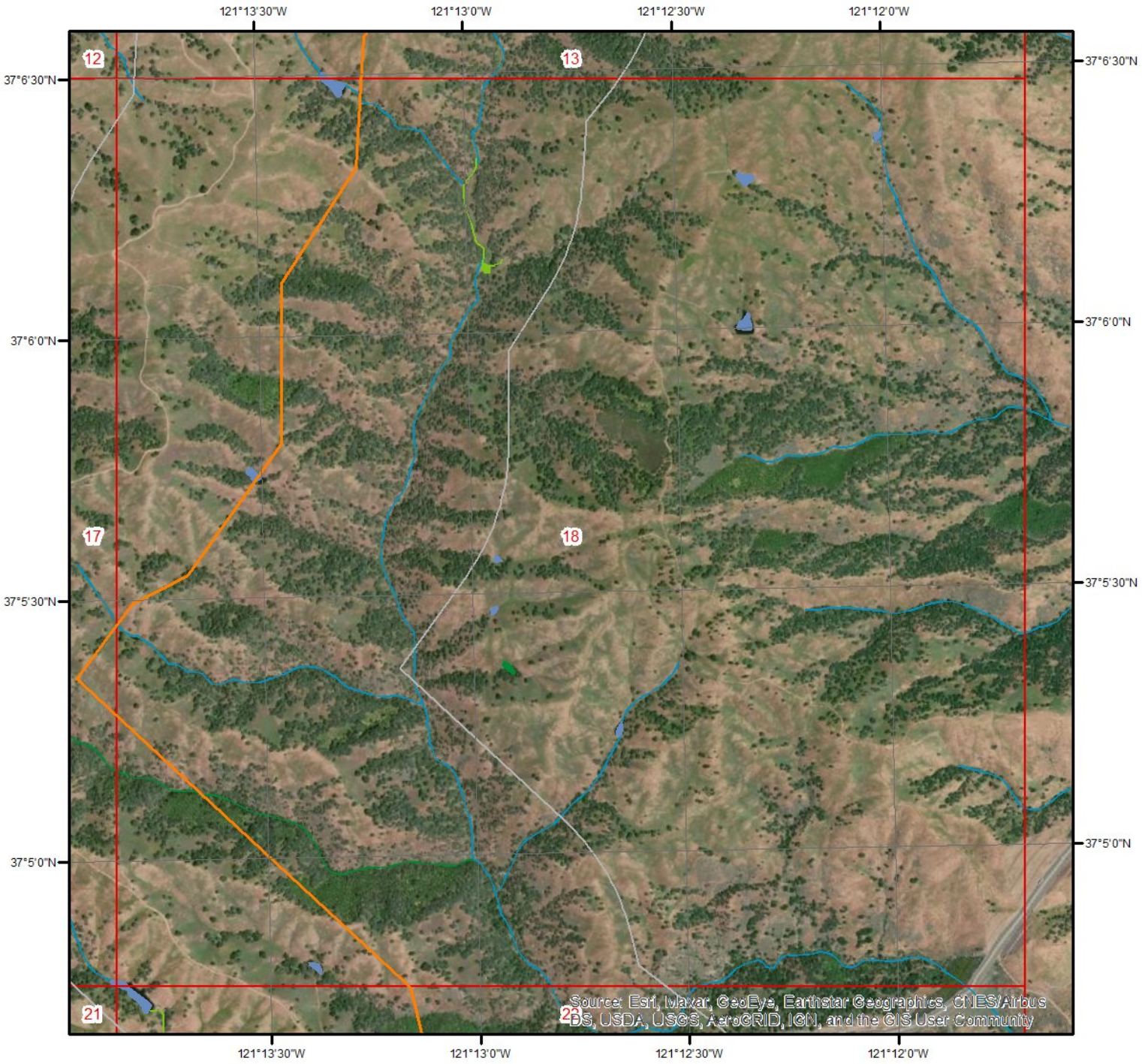
N

This map shows wetland existence using data from US Fish & Wildlife.
Data coverage is shown to the right. Gray indicates no data available in the area.

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Wetland Type - Page 18

0 0.125 0.25 0.5 Miles

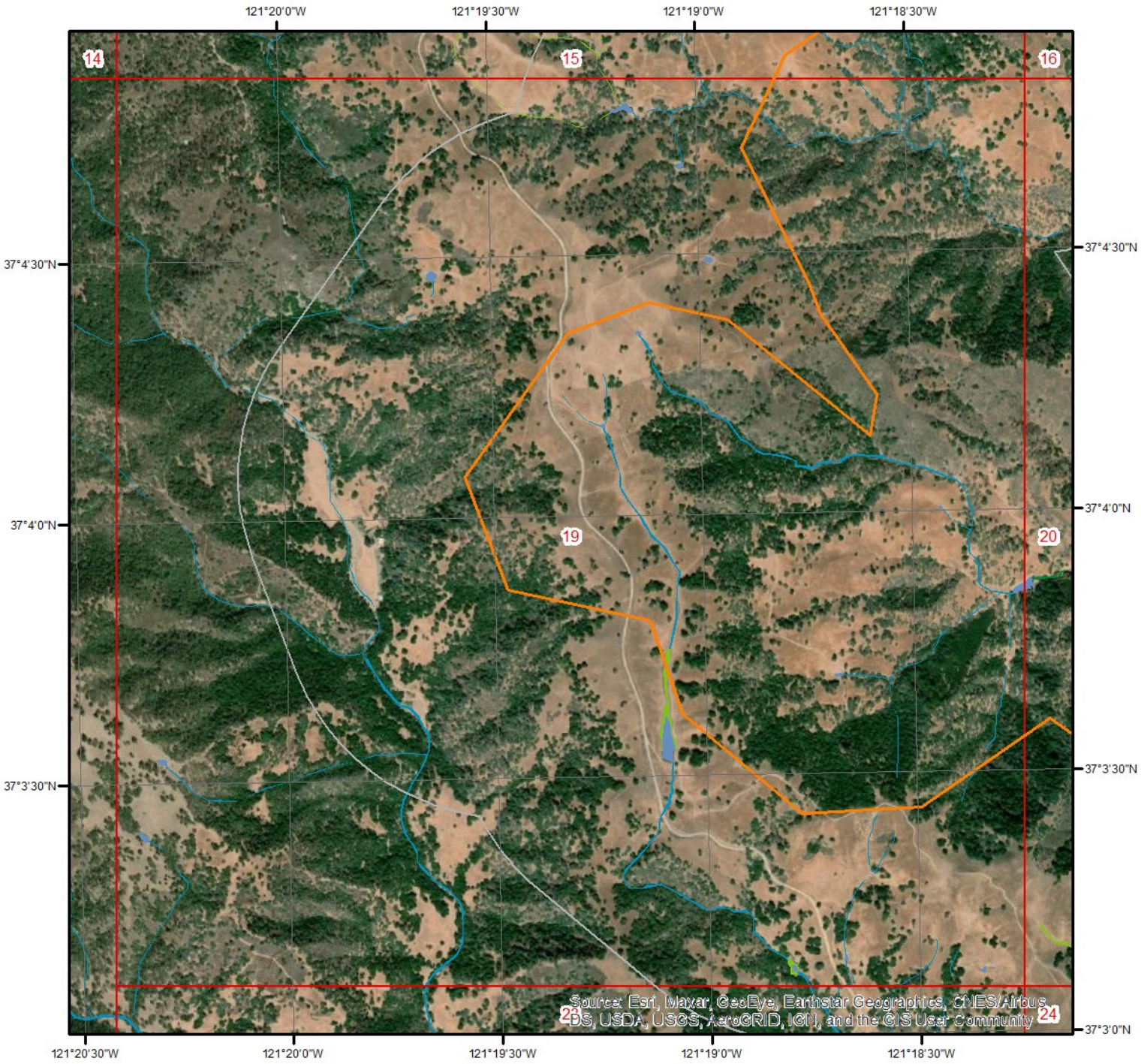
N

This map shows wetland existence using data from US Fish & Wildlife.
Data coverage is shown to the right. Gray indicates no data available in the area.

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Wetland Type - Page 19

0 0.125 0.25 0.5 Miles

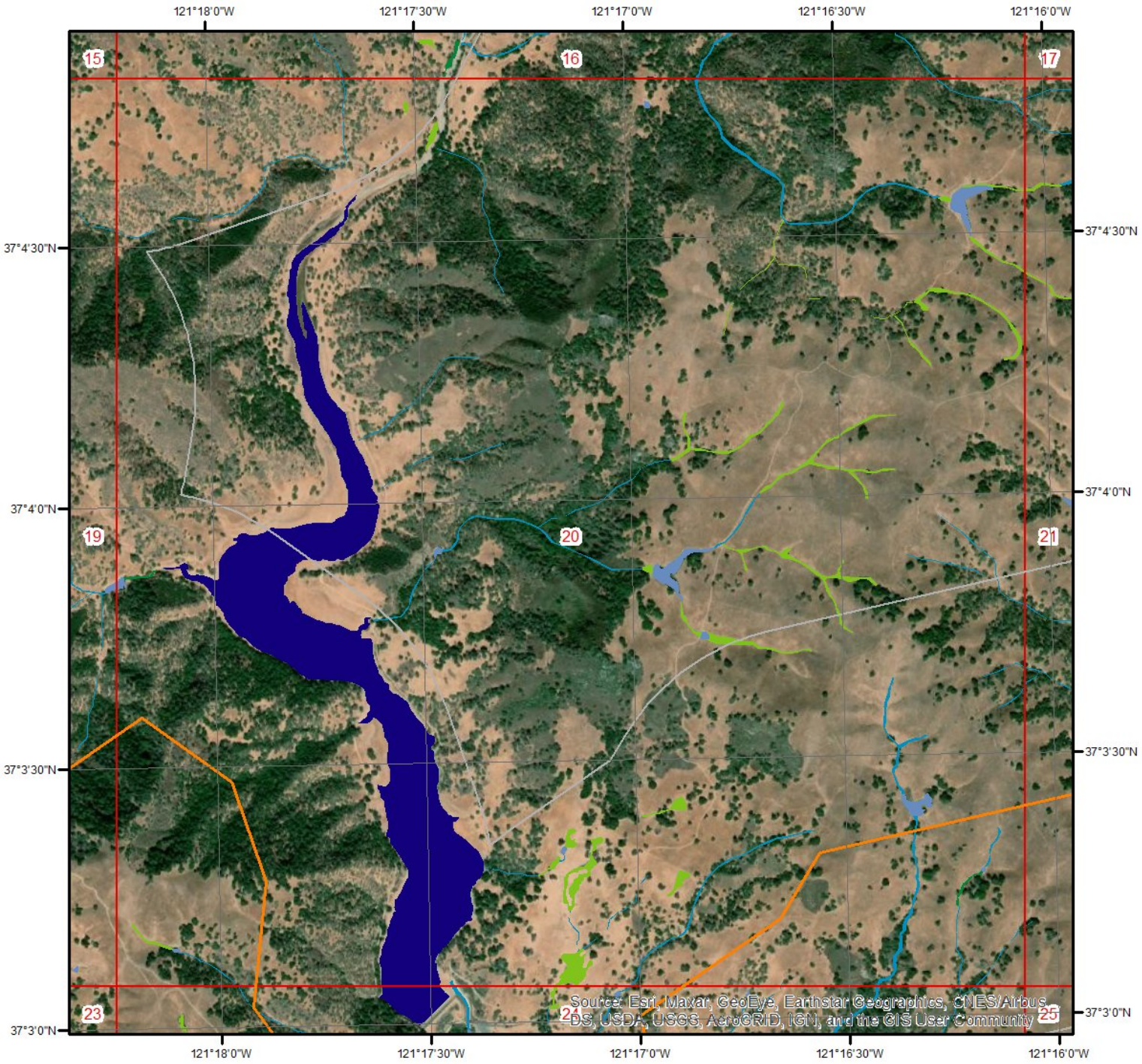
N

This map shows wetland existence using data from US Fish & Wildlife.
Data coverage is shown to the right. Gray indicates no data available in the area.

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Wetland Type - Page 20

0 0.125 0.25 0.5 Miles

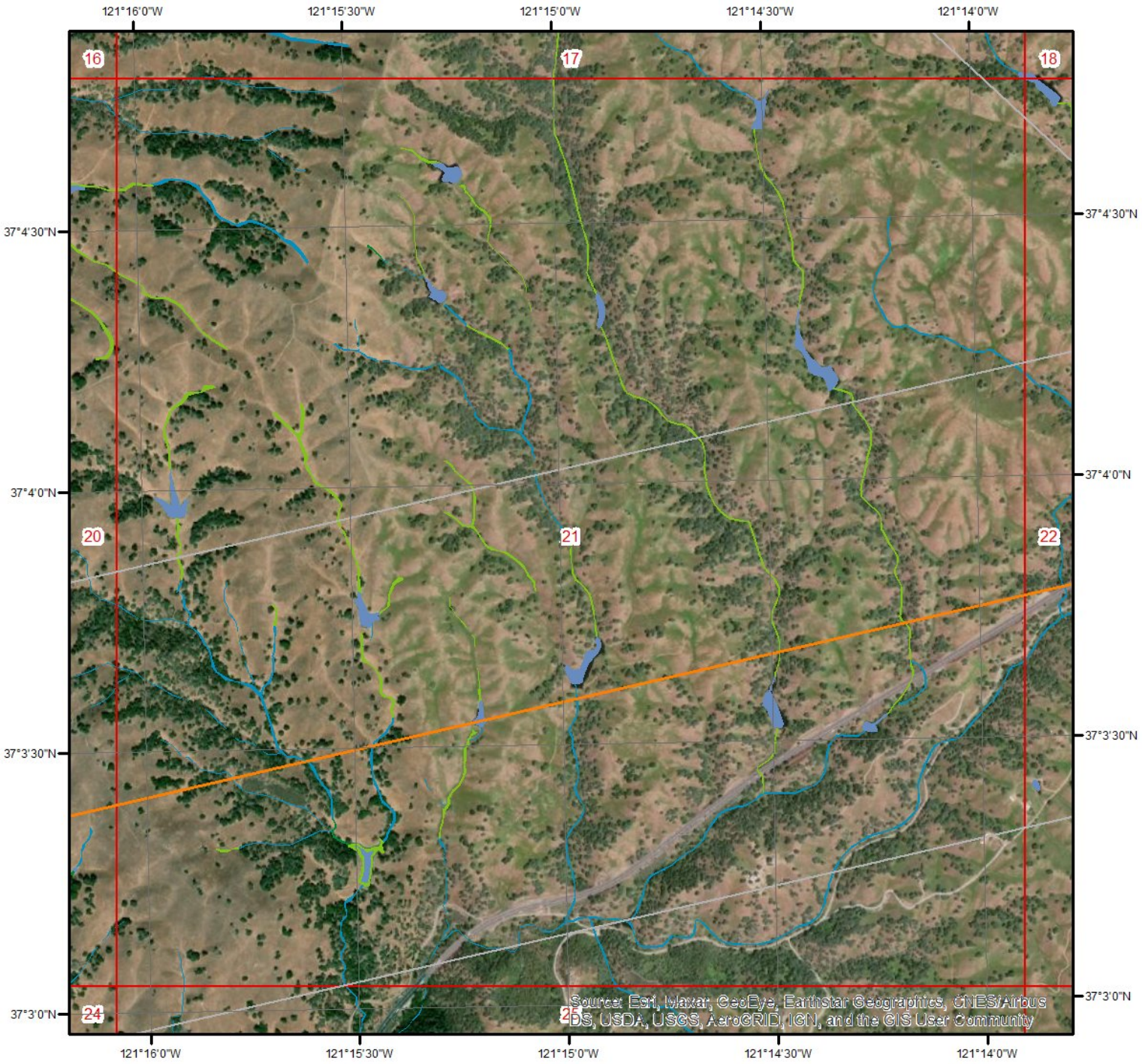
N

This map shows wetland existence using data from US Fish & Wildlife.
Data coverage is shown to the right. Gray indicates no data available in the area.

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Wetland Type - Page 21

0 0.125 0.25 0.5 Miles

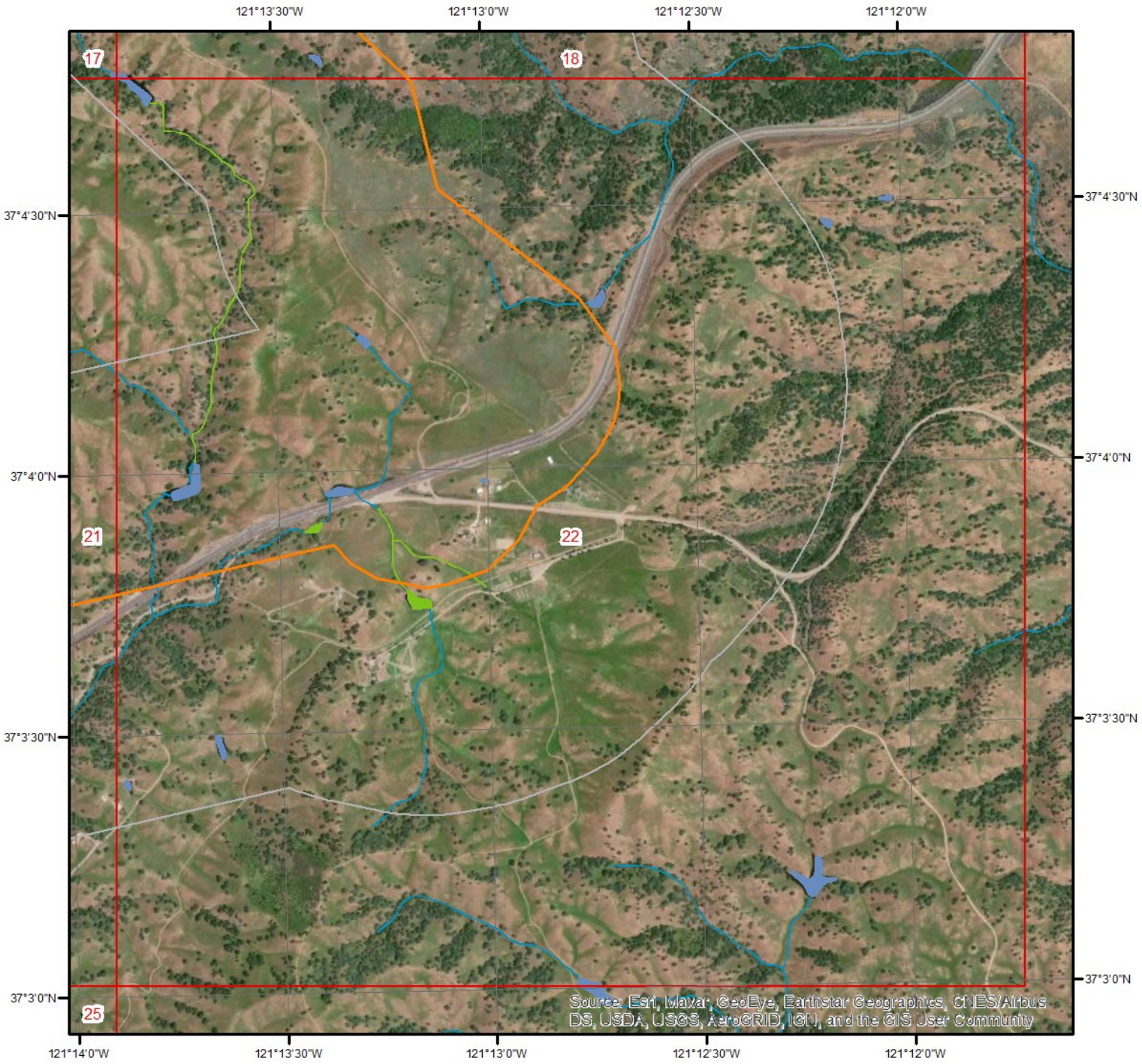
N

This map shows wetland existence using data from US Fish & Wildlife.
Data coverage is shown to the right. Gray indicates no data available in the area.

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Wetland Type - Page 22

0 0.125 0.25 0.5 Miles

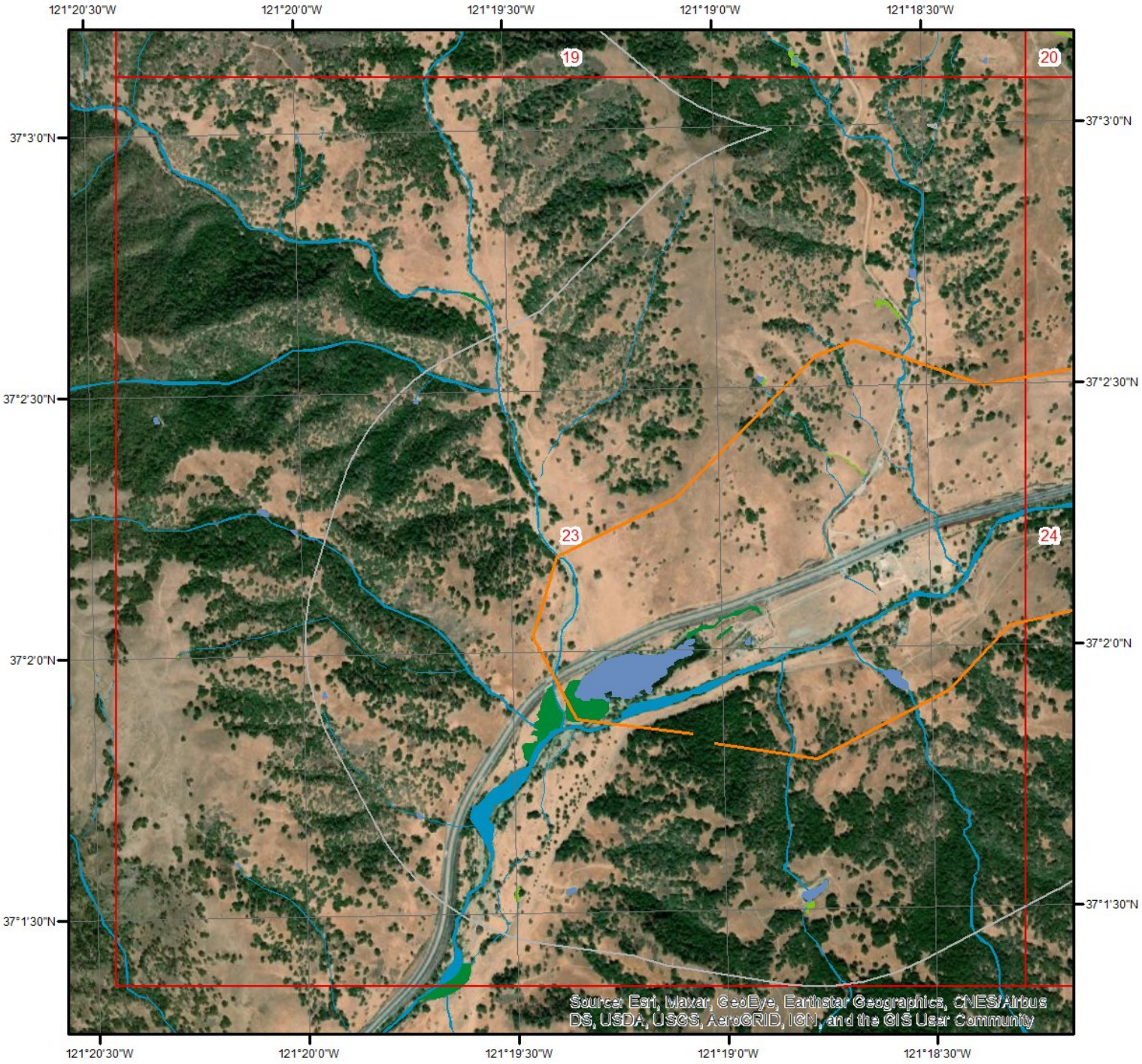
N

This map shows wetland existence using data from US Fish & Wildlife.
Data coverage is shown to the right. Gray indicates no data available in the area.

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Wetland Type - Page 23

0 0.125 0.25 0.5 Miles

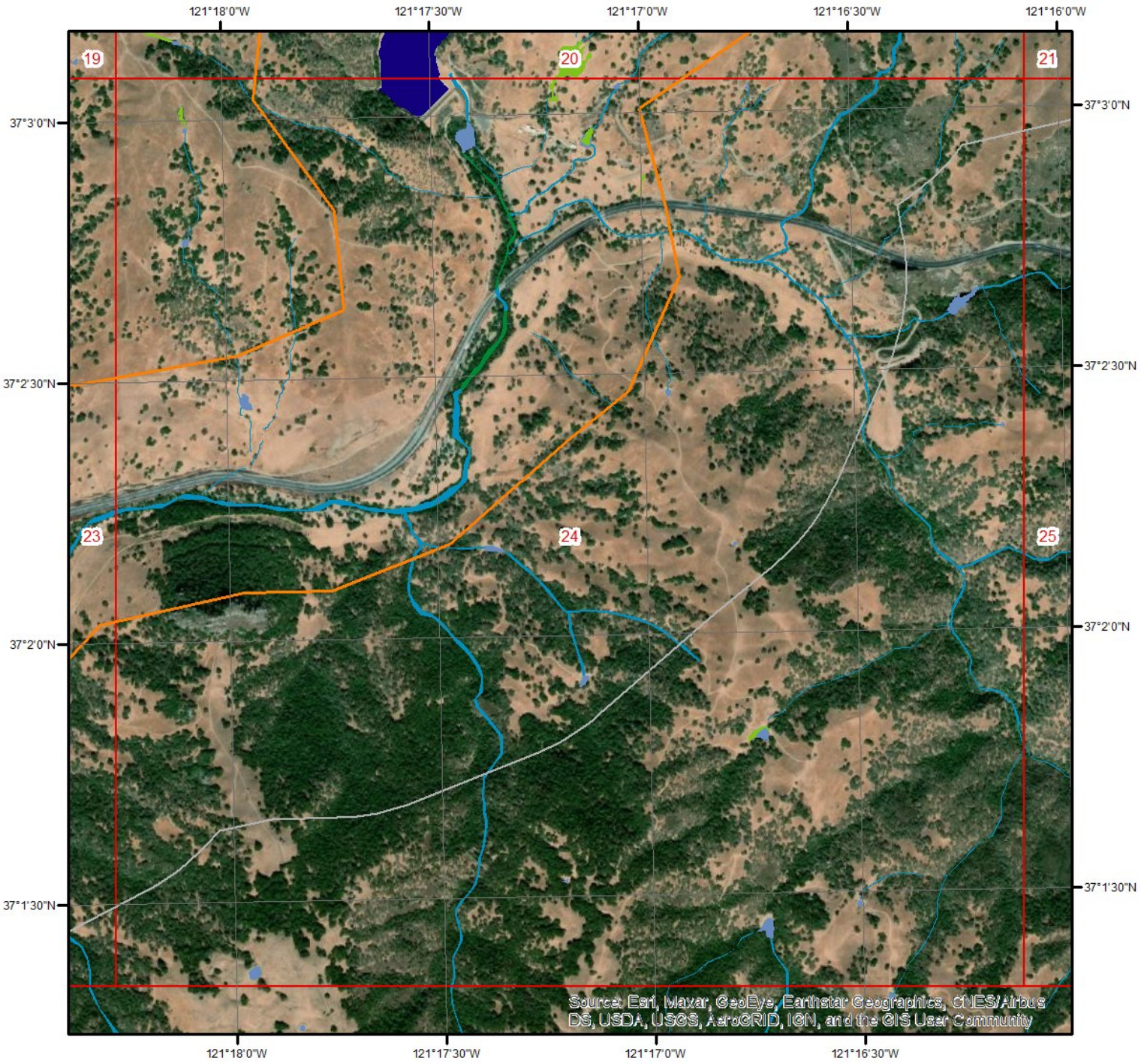
N

This map shows wetland existence using data from US Fish & Wildlife.
Data coverage is shown to the right. Gray indicates no data available in the area.

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Wetland Type - Page 24

0 0.125 0.25 0.5 Miles

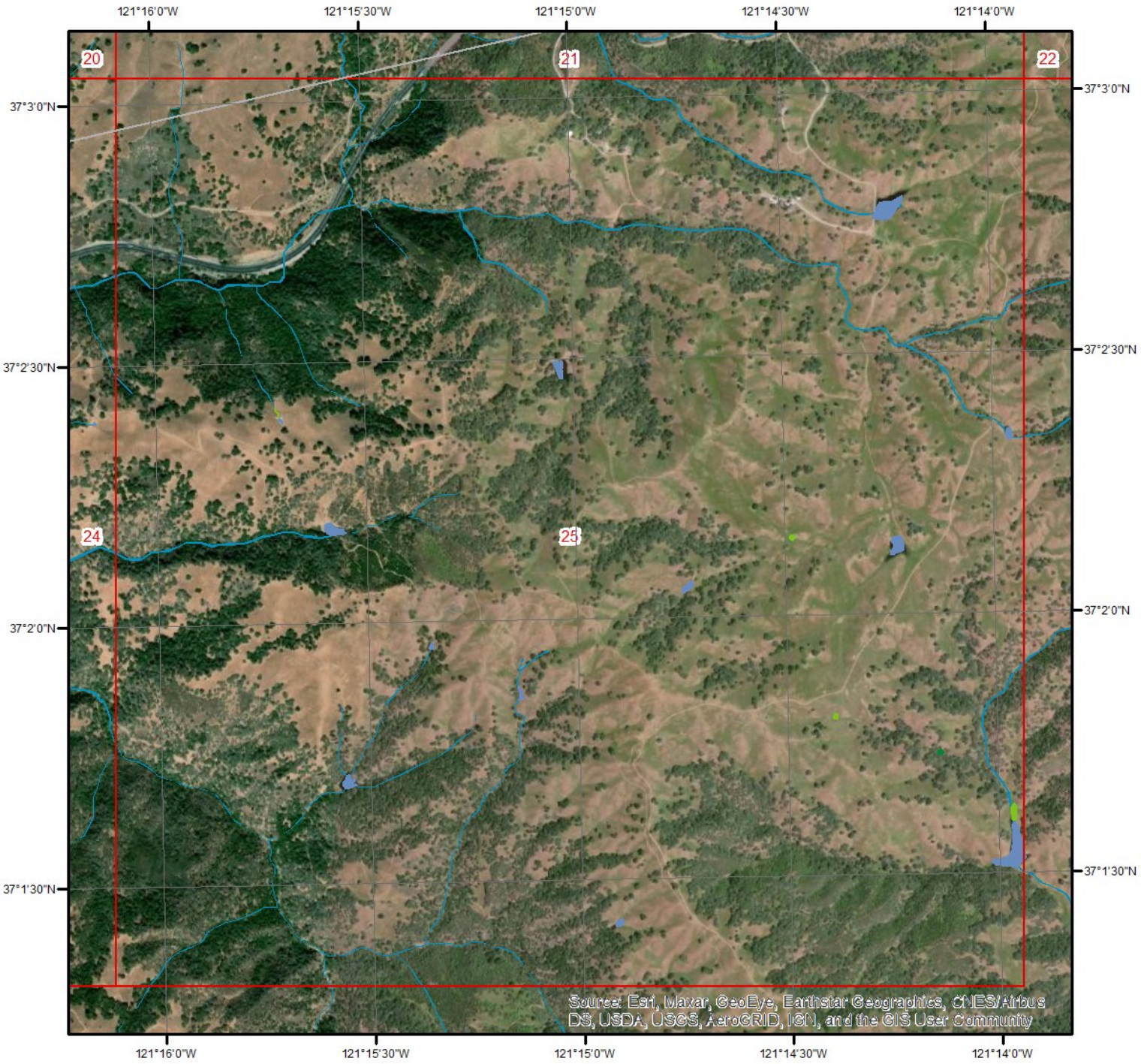
N

This map shows wetland existence using data from US Fish & Wildlife.
Data coverage is shown to the right. Gray indicates no data available in the area.

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Wetland Type - Page 25

0 0.125 0.25 0.5 Miles

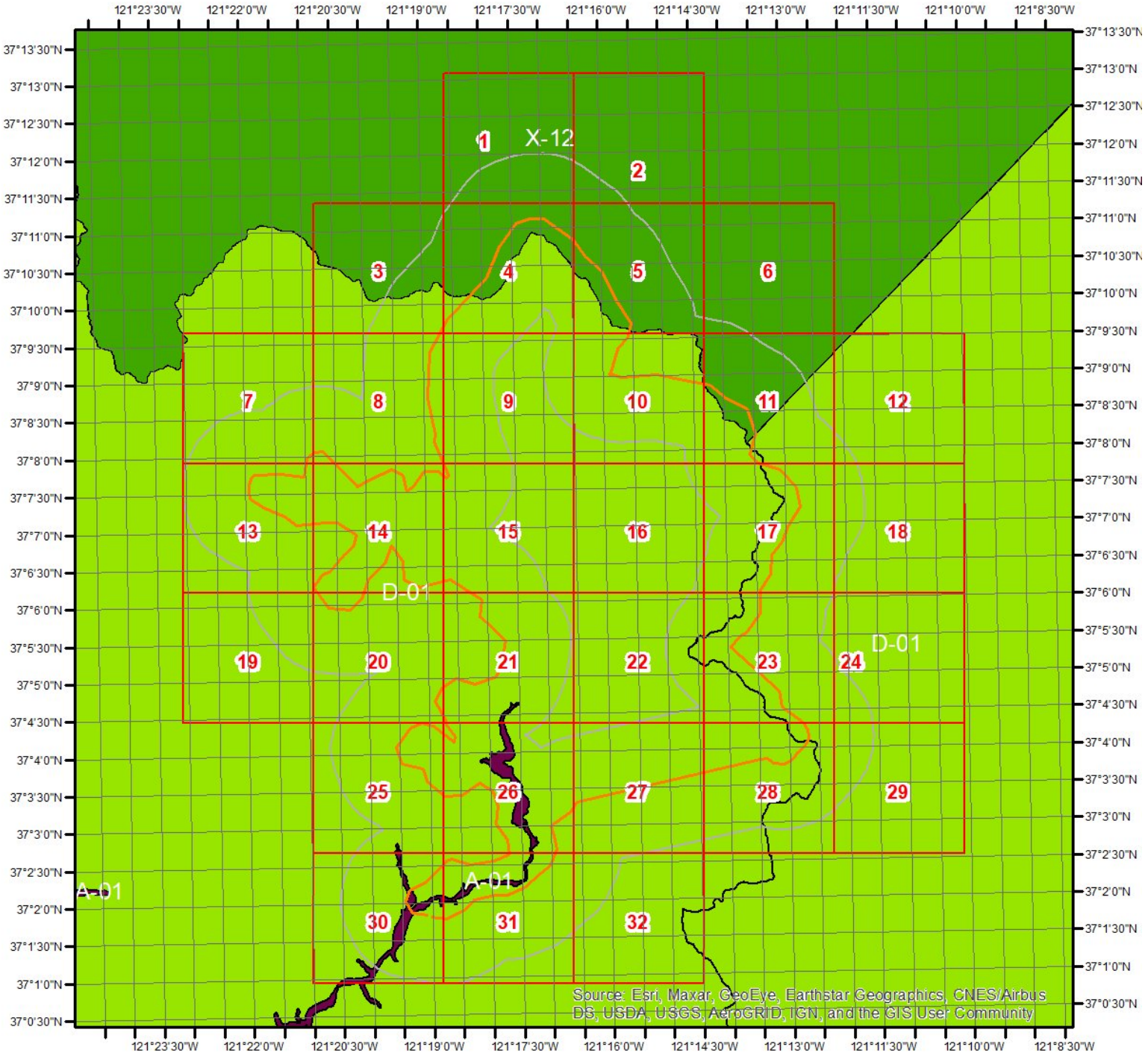
N

This map shows wetland existence using data from US Fish & Wildlife.
Data coverage is shown to the right. Gray indicates no data available in the area.

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Flood Hazard Zones

Miles
0 0.40.8 1.6 2.4

This map shows FEMA flood hazard zones. FIRM panels are shown to the right, and blank indicates no data is available.

A	AO	X
A99	V	OPEN WATER
AE	VE	NOT POPULATED
AH	D	AREA NOT INCLUDED

N

06099C1025E
06085C0525H
06085C0700H
06085C0670H

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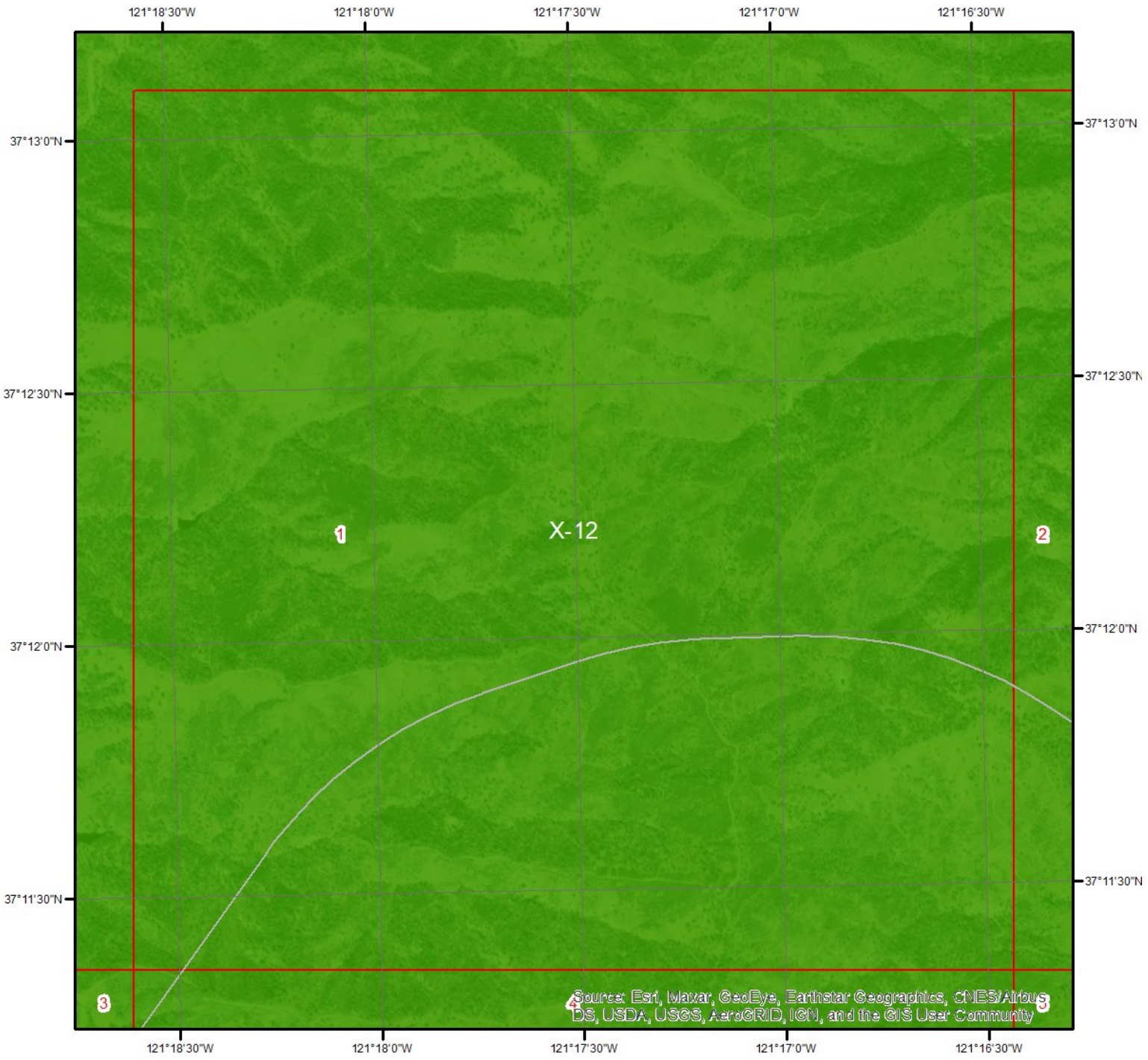
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Flood Hazard Zones - Page 1

This map shows FEMA flood hazard zones. FIRM panels are shown to the right, and blank indicates no data is available.

Miles
0 0.2 0.4

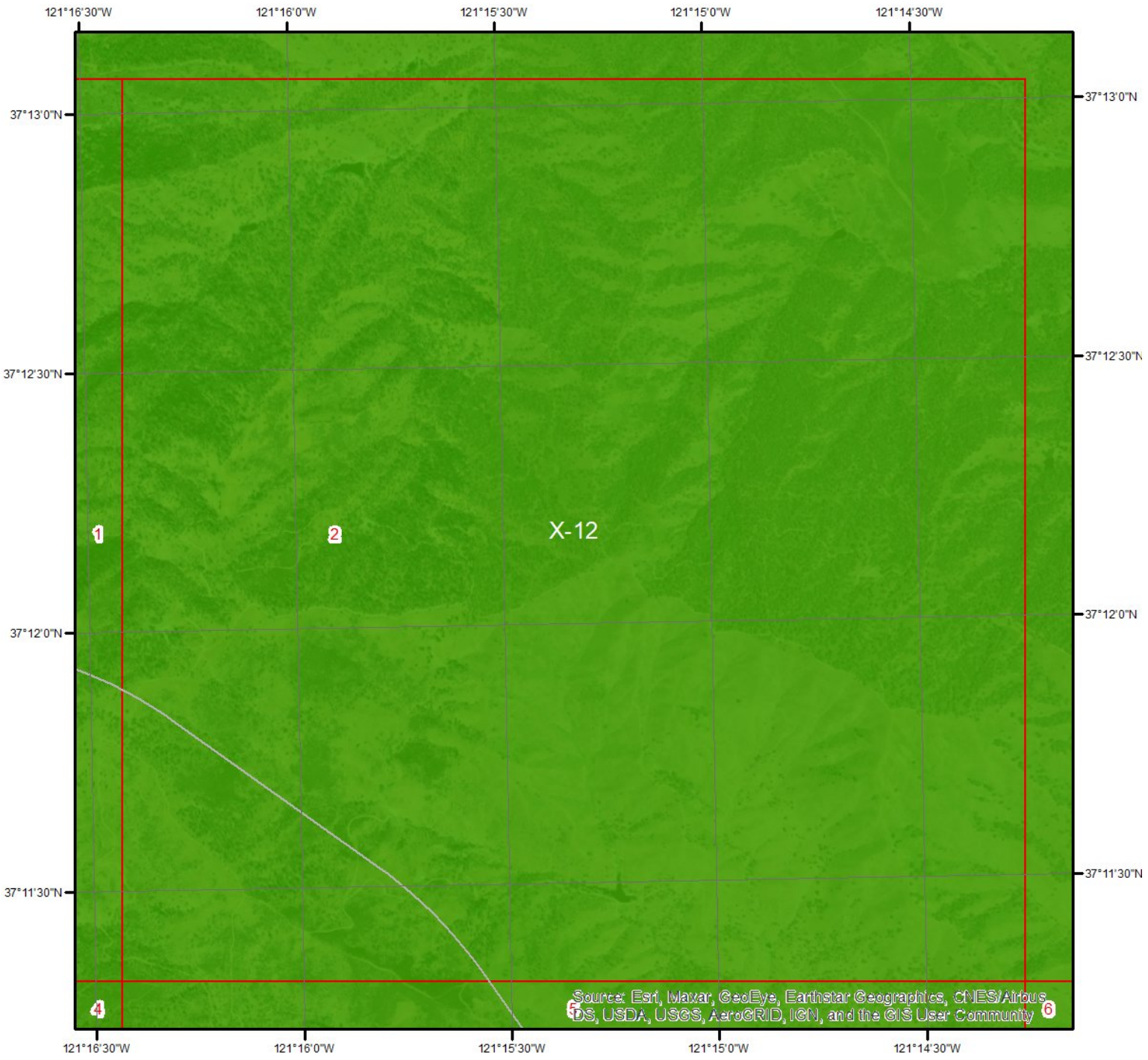
N

06099C1025E
06085C0525H

A	AO	X
A99	V	OPEN WATER
AE	VE	NOT POPULATED
AH	D	AREA NOT INCLUDED

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Flood Hazard Zones - Page 2

This map shows FEMA flood hazard zones. FIRM panels are shown to the right, and blank indicates no data is available.

Miles
0 0.2 0.4

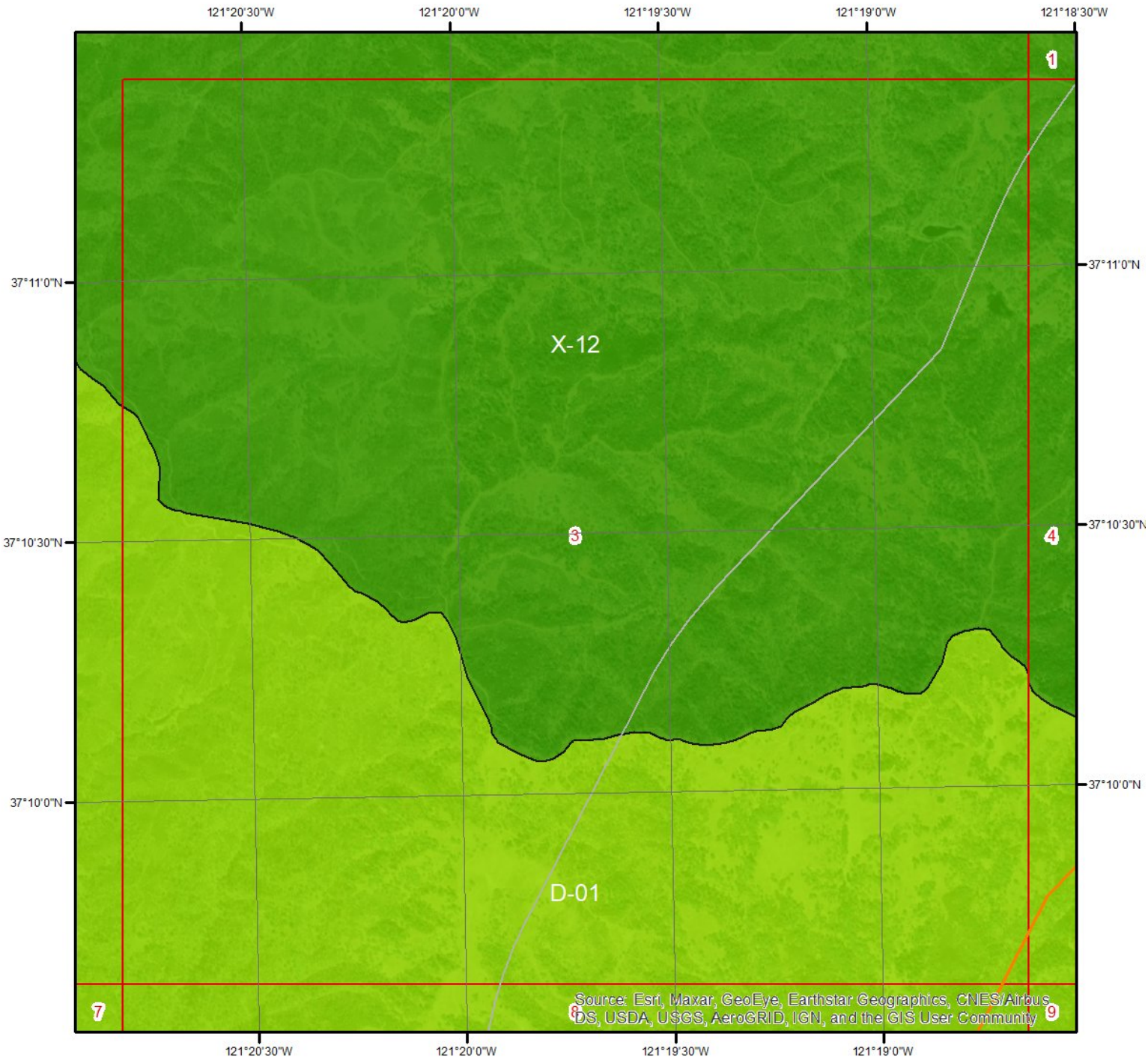
N

06085C0525H
06099C1025E
06099C1050E

A	AO	X
A99	V	OPEN WATER
AE	VE	NOT POPULATED
AH	D	AREA NOT INCLUDED

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Flood Hazard Zones - Page 3

This map shows FEMA flood hazard zones. FIRM panels are shown to the right, and blank indicates no data is available.

Miles
0 0.2 0.4

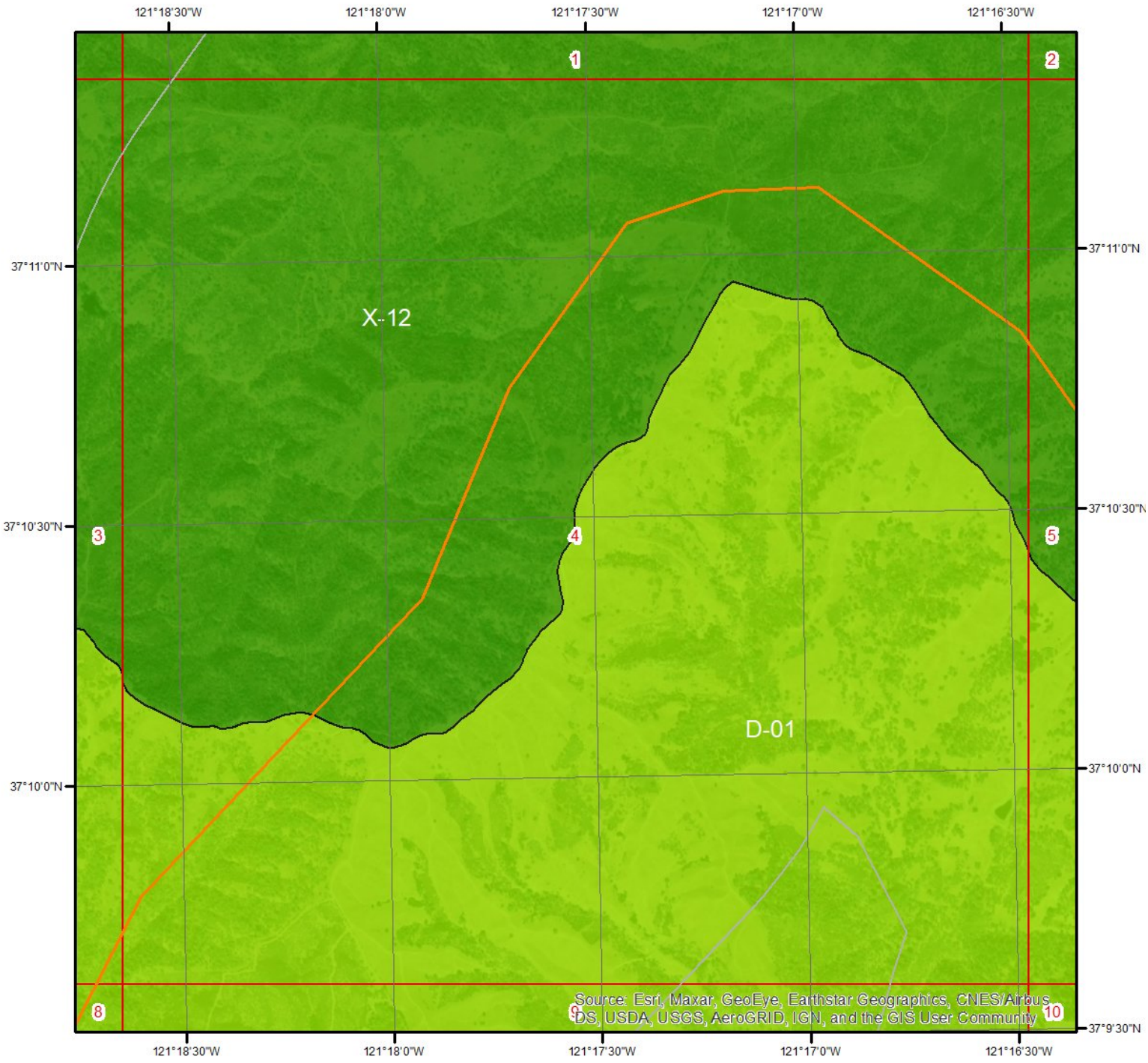
N

06099C1025E
06085C0525H

A	AO	X
A99	V	OPEN WATER
AE	VE	NOT POPULATED
AH	D	AREA NOT INCLUDED

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Flood Hazard Zones - Page 4

This map shows FEMA flood hazard zones. FIRM panels are shown to the right, and blank indicates no data is available.

A	AO	X
A99	V	OPEN WATER
AE	VE	NOT POPULATED
AH	D	AREA NOT INCLUDED

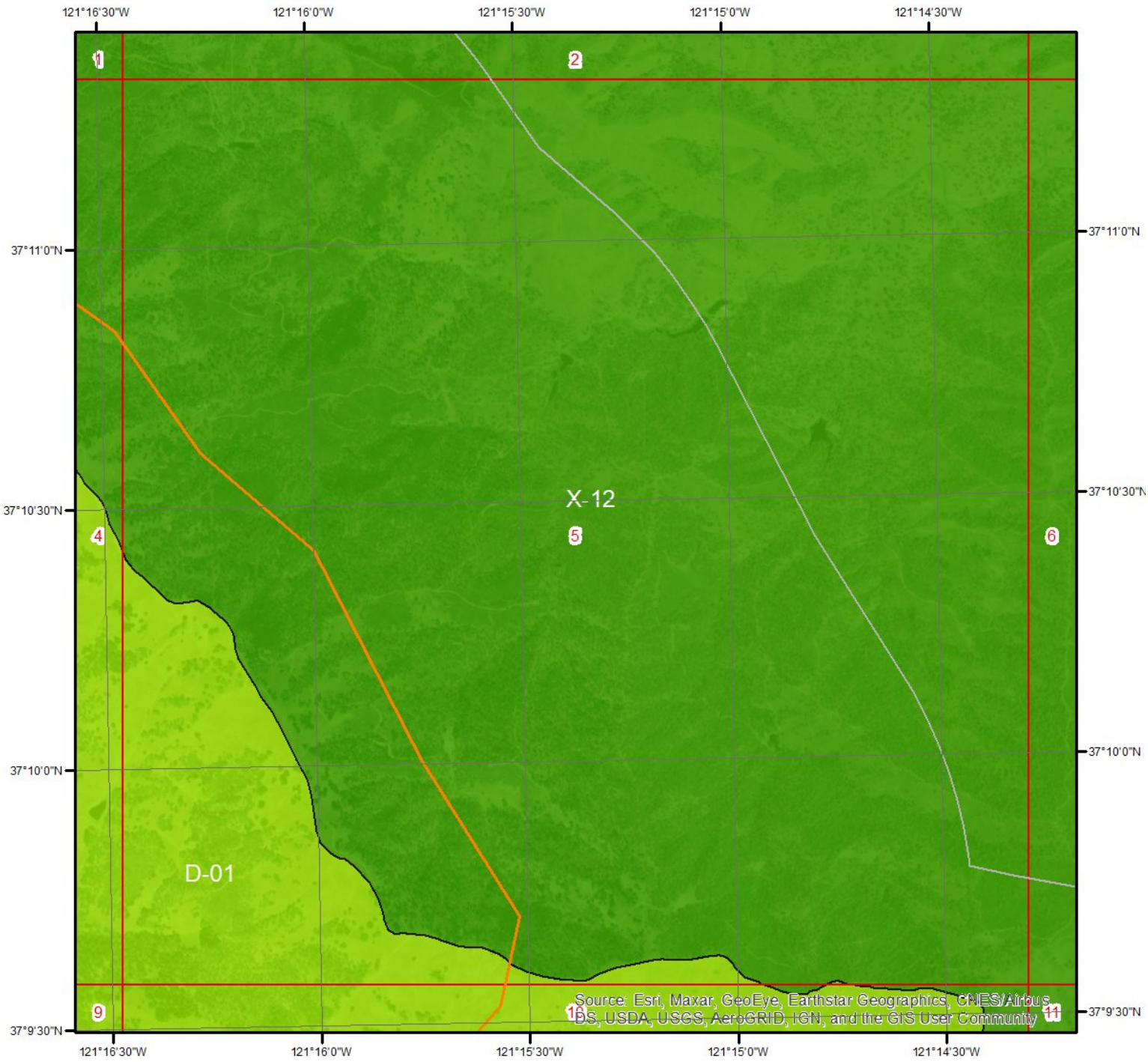
0 0.2 0.4 Miles

N

06099C1025E
06085C0525H

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Flood Hazard Zones - Page 5

This map shows FEMA flood hazard zones. FIRM panels are shown to the right, and blank indicates no data is available.

A	AO	X
A99	V	OPEN WATER
AE	VE	NOT POPULATED
AH	D	AREA NOT INCLUDED

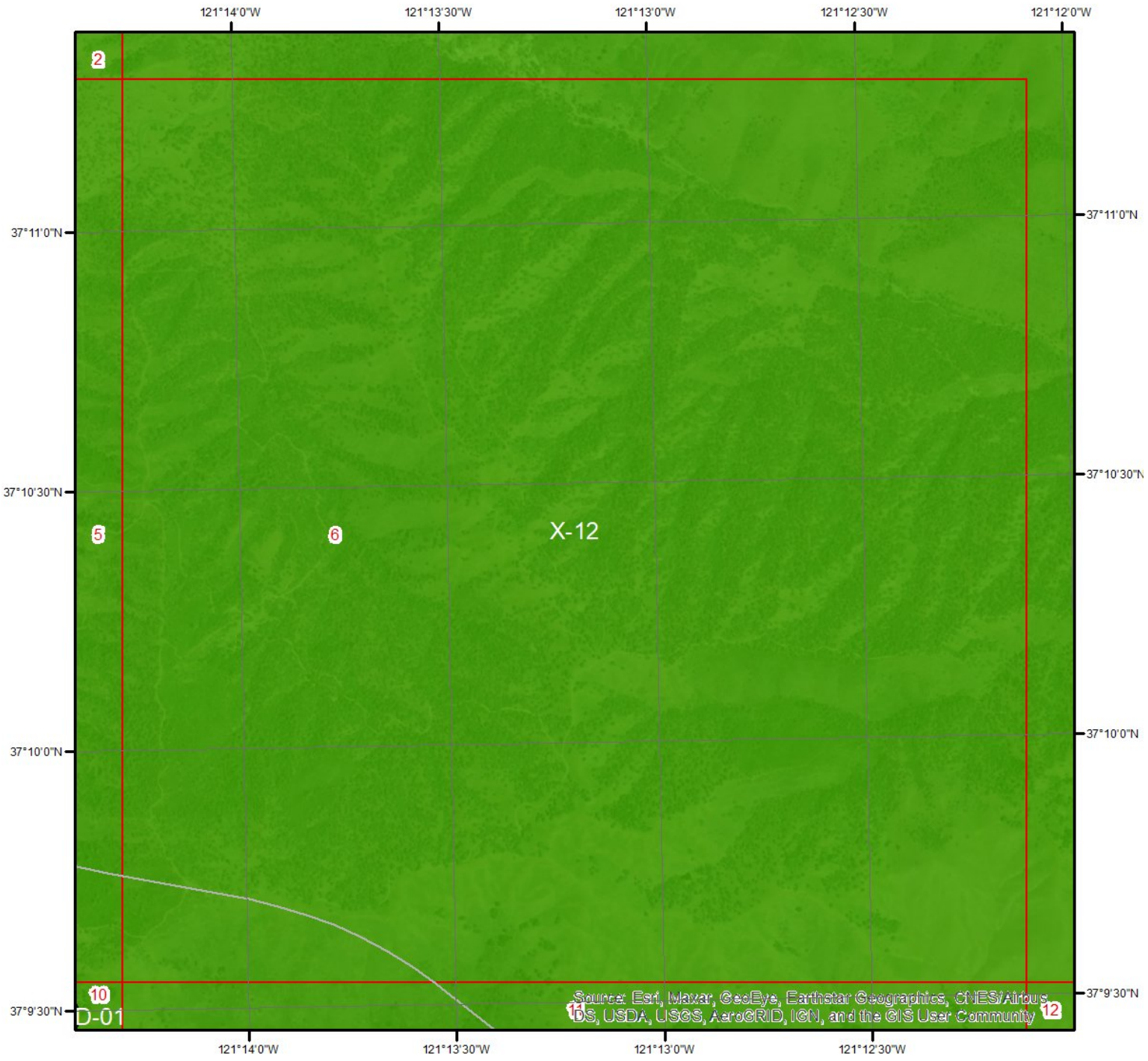
0 0.2 0.4 Miles

N

06099C1025E
06085C0525H
06099C1050E

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Flood Hazard Zones - Page 6

This map shows FEMA flood hazard zones. FIRM panels are shown to the right, and blank indicates no data is available.

Miles
0 0.2 0.4

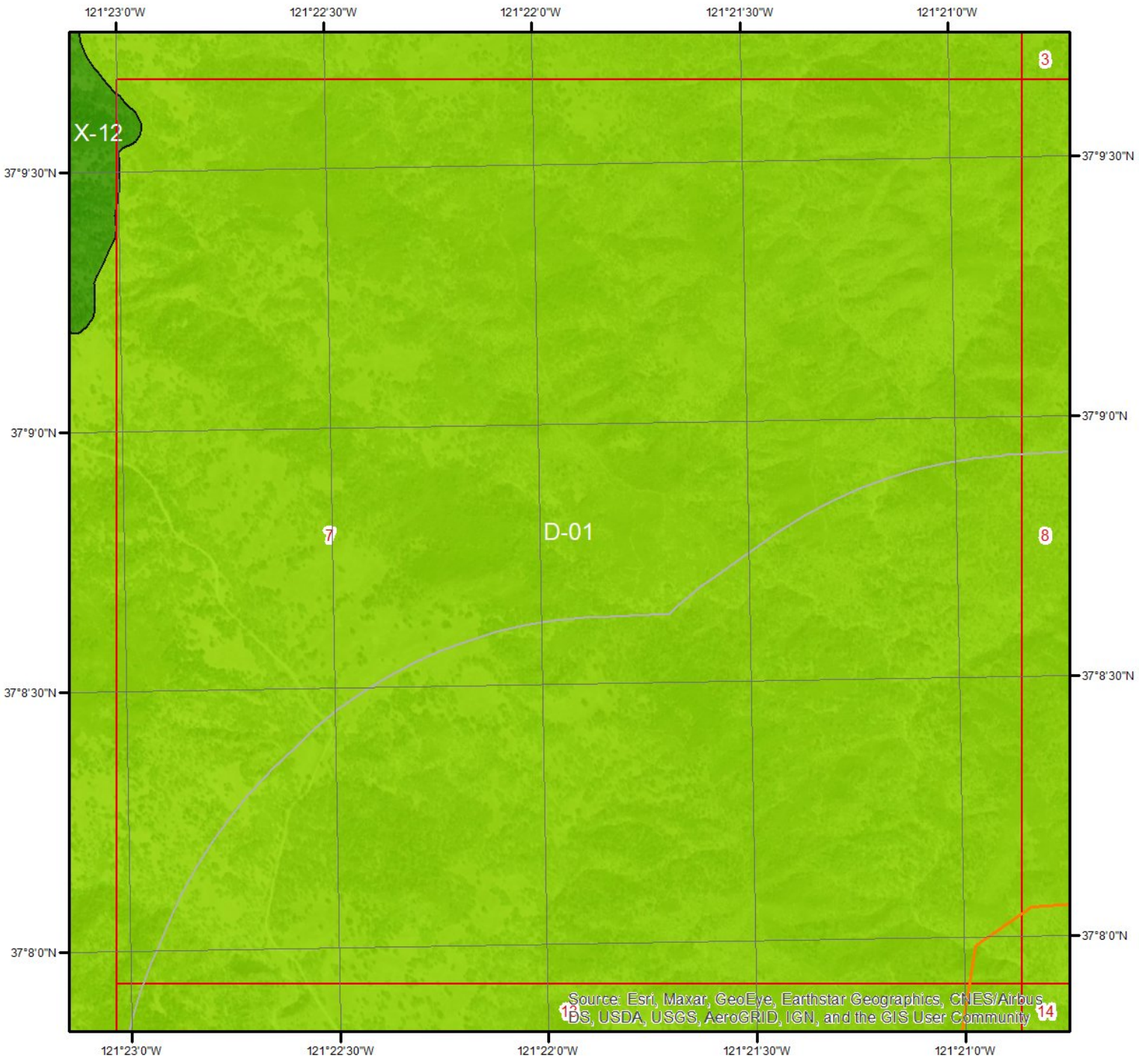
N

06047C0525G
06099C1050E
06085C0550H

A	AO	X
A99	V	OPEN WATER
AE	VE	NOT POPULATED
AH	D	AREA NOT INCLUDED

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Flood Hazard Zones - Page 7

This map shows FEMA flood hazard zones. FIRM panels are shown to the right, and blank indicates no data is available.

Miles
0 0.2 0.4

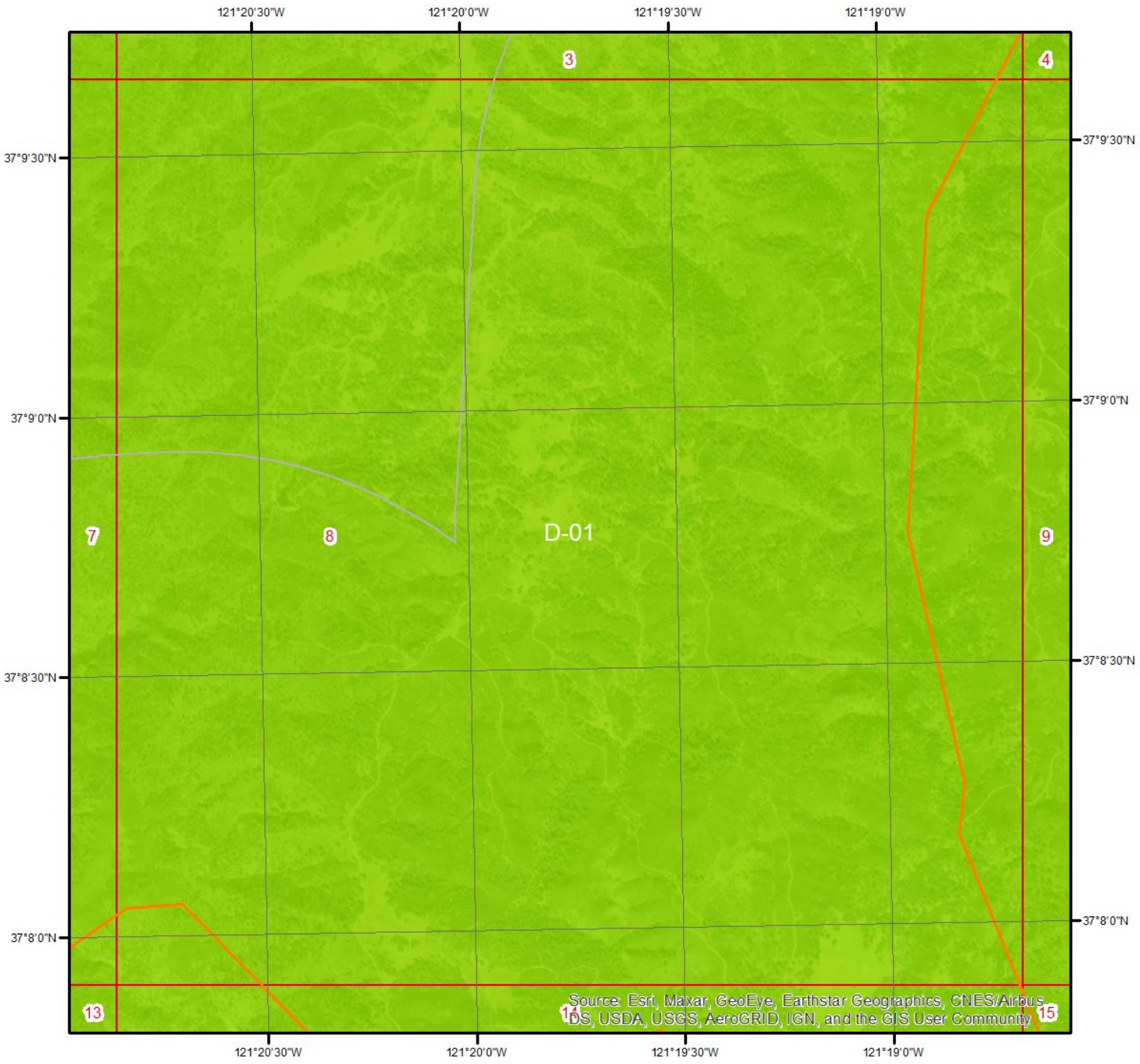
N

06099C1000E
06099C1025E
06085C0525H

A	AO	X
A99	V	OPEN WATER
AE	VE	NOT POPULATED
AH	D	AREA NOT INCLUDED

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Flood Hazard Zones - Page 8

This map shows FEMA flood hazard zones. FIRM panels are shown to the right, and blank indicates no data is available.

A	AO	X
A99	V	OPEN WATER
AE	VE	NOT POPULATED
AH	D	AREA NOT INCLUDED

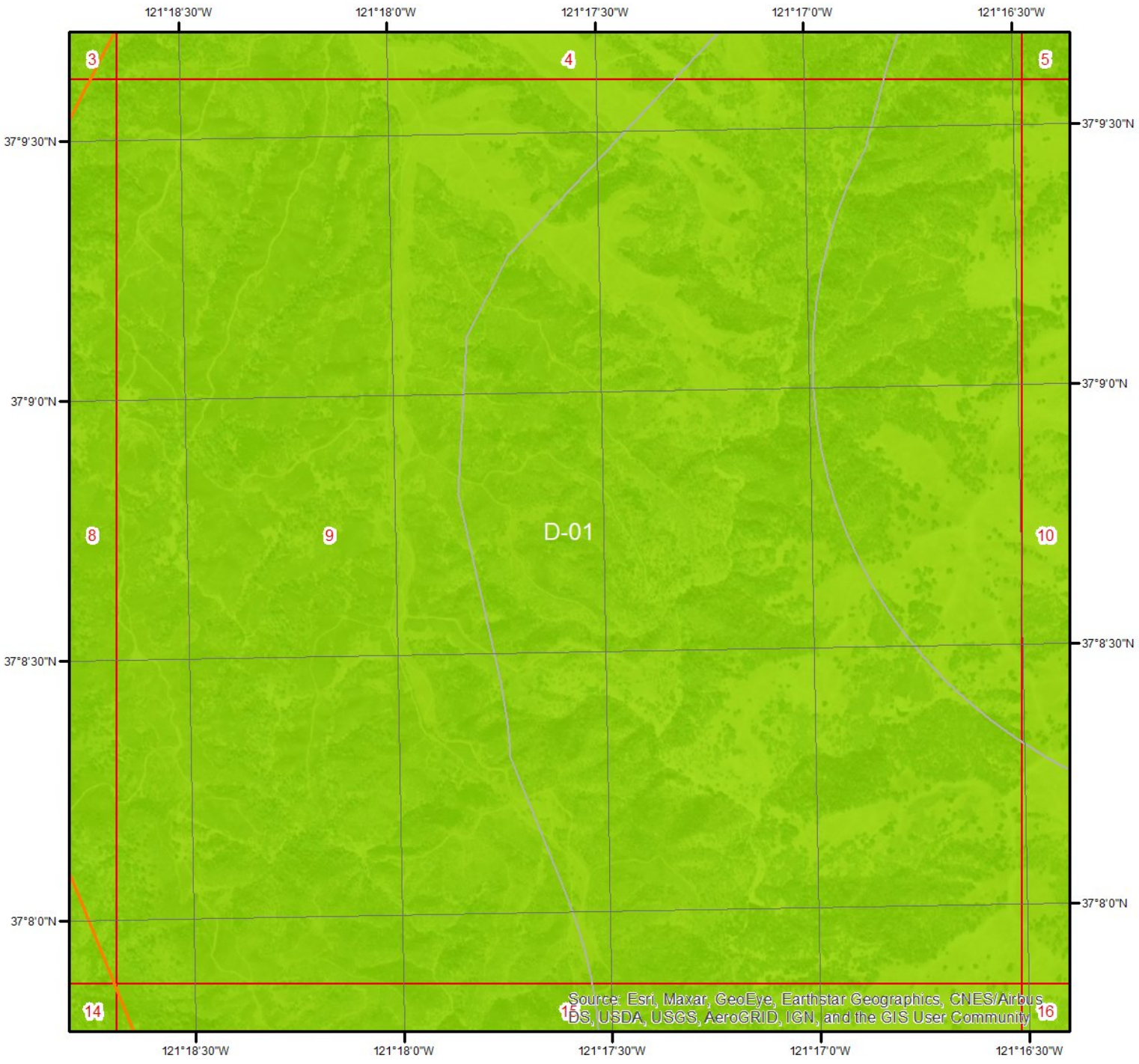
0 0.2 0.4 Miles

N

06099C1025E
06085C0525H

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Flood Hazard Zones - Page 9

This map shows FEMA flood hazard zones. FIRM panels are shown to the right, and blank indicates no data is available.

Miles
0 0.2 0.4

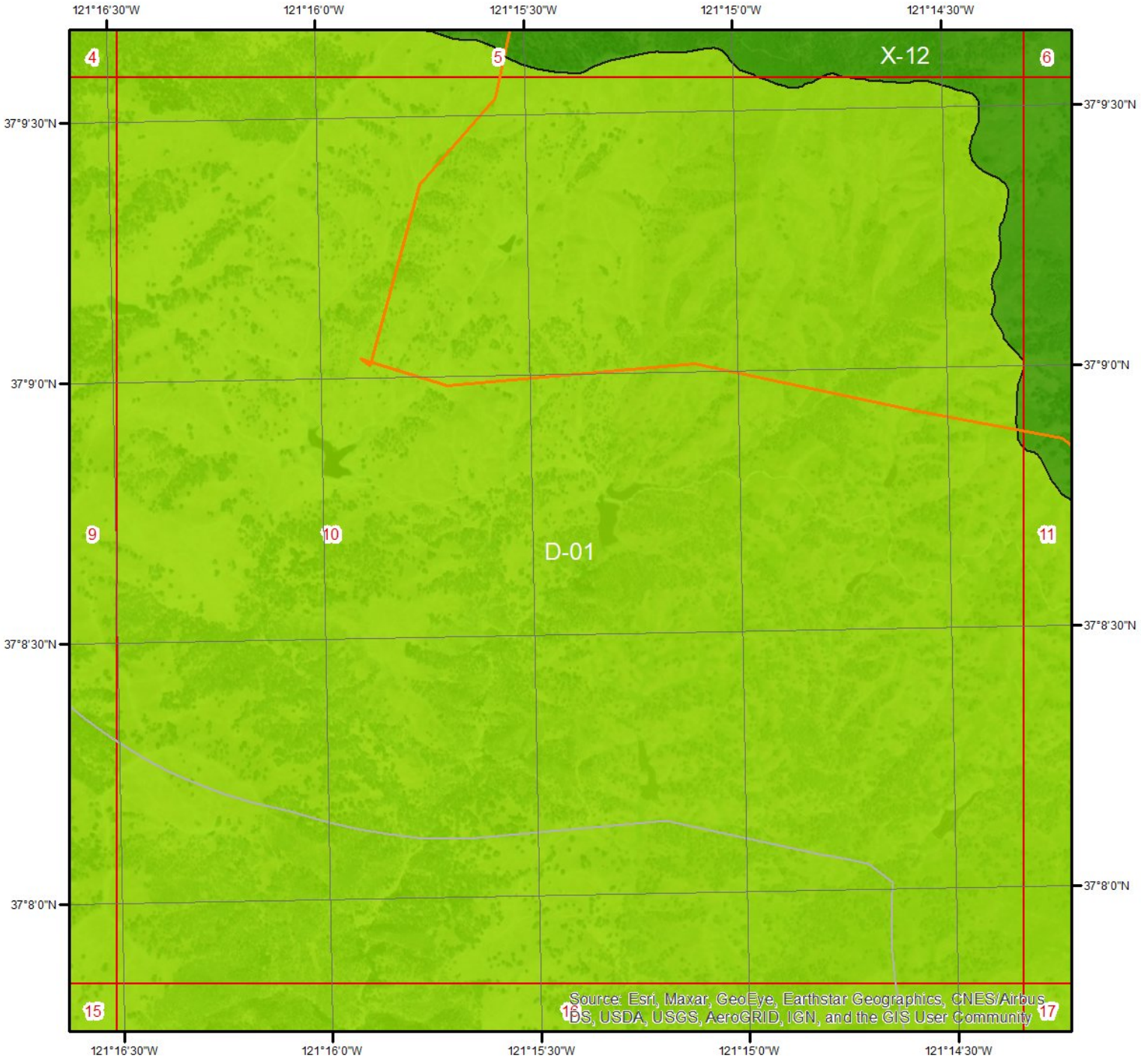
N

06099C1025E
06085C0525H

A	AO	X
A99	V	OPEN WATER
AE	VE	NOT POPULATED
AH	D	AREA NOT INCLUDED

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Flood Hazard Zones - Page 10

This map shows FEMA flood hazard zones. FIRM panels are shown to the right, and blank indicates no data is available.

A	AO	X
A99	V	OPEN WATER
AE	VE	NOT POPULATED
AH	D	AREA NOT INCLUDED

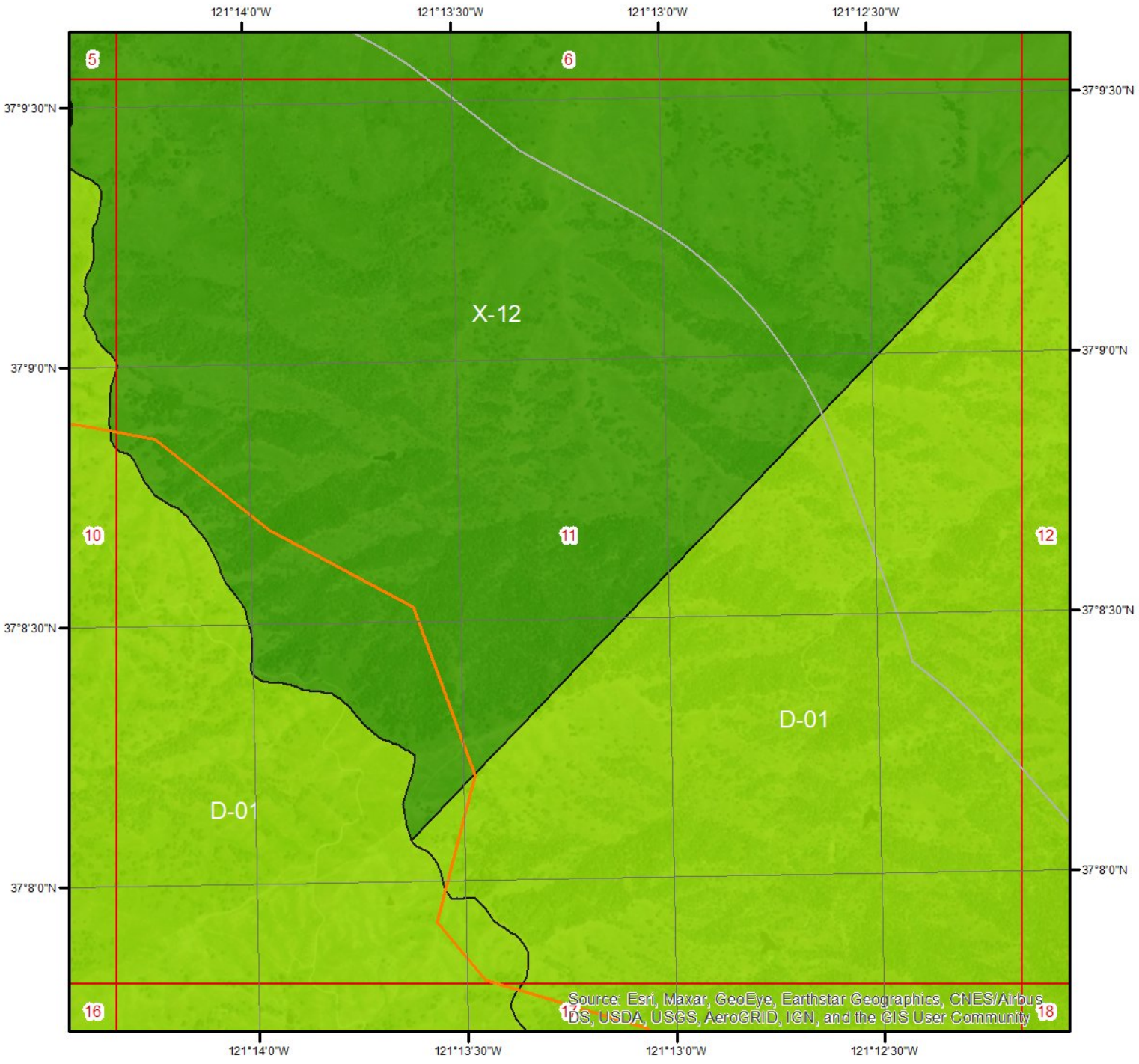
Miles
0 0.2 0.4

N

06099C1025E
06085C0525H
06099C1050E

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Flood Hazard Zones - Page 11

This map shows FEMA flood hazard zones. FIRM panels are shown to the right, and blank indicates no data is available.

A	AO	X
A99	V	OPEN WATER
AE	VE	NOT POPULATED
AH	D	AREA NOT INCLUDED

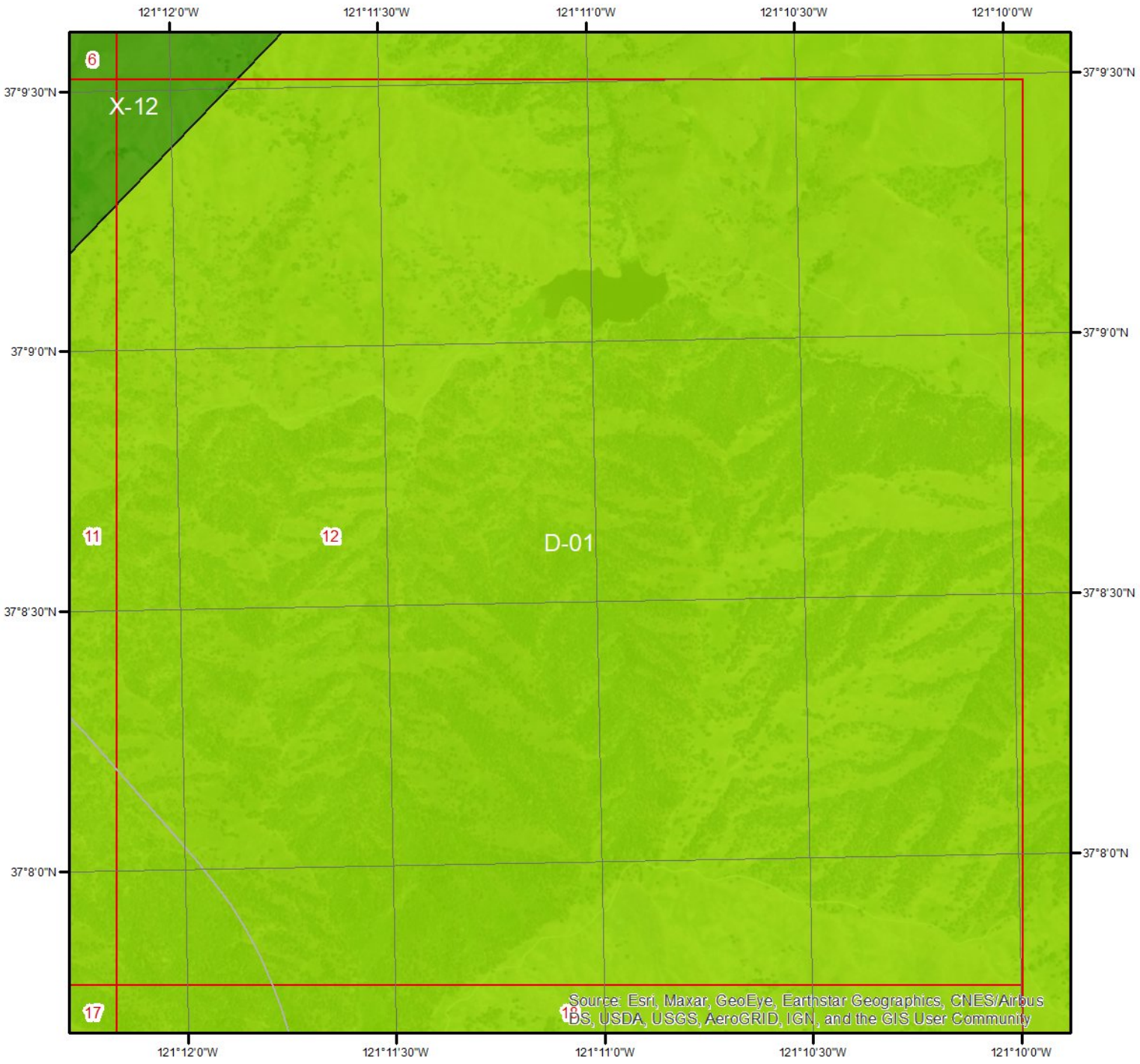
0 0.2 0.4 Miles

N

06047C0525G
06099C1050E
06085C0550H
06085C0725H

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Flood Hazard Zones - Page 12

This map shows FEMA flood hazard zones. FIRM panels are shown to the right, and blank indicates no data is available.

Miles
0 0.2 0.4

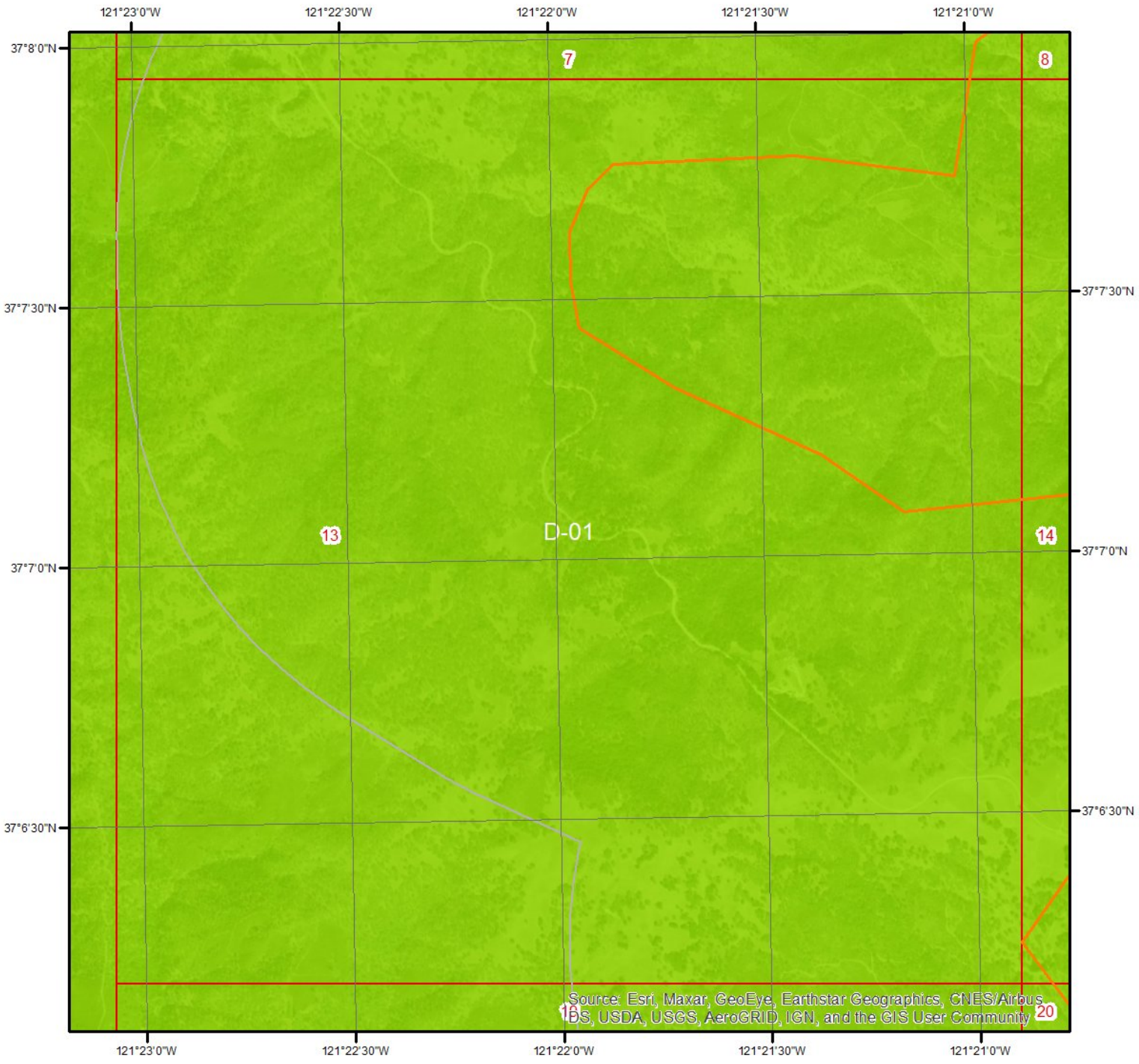
N

06047C0525G
06099C1050E
06085C0550H
06085C0725H

A	AO	X
A99	V	OPEN WATER
AE	VE	NOT POPULATED
AH	D	AREA NOT INCLUDED

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Flood Hazard Zones - Page 13

This map shows FEMA flood hazard zones. FIRM panels are shown to the right, and blank indicates no data is available.

A	AO	X
A99	V	OPEN WATER
AE	VE	NOT POPULATED
AH	D	AREA NOT INCLUDED

0 0.2 0.4 Miles

N

06099C1025E
06085C0700H
06085C0660H

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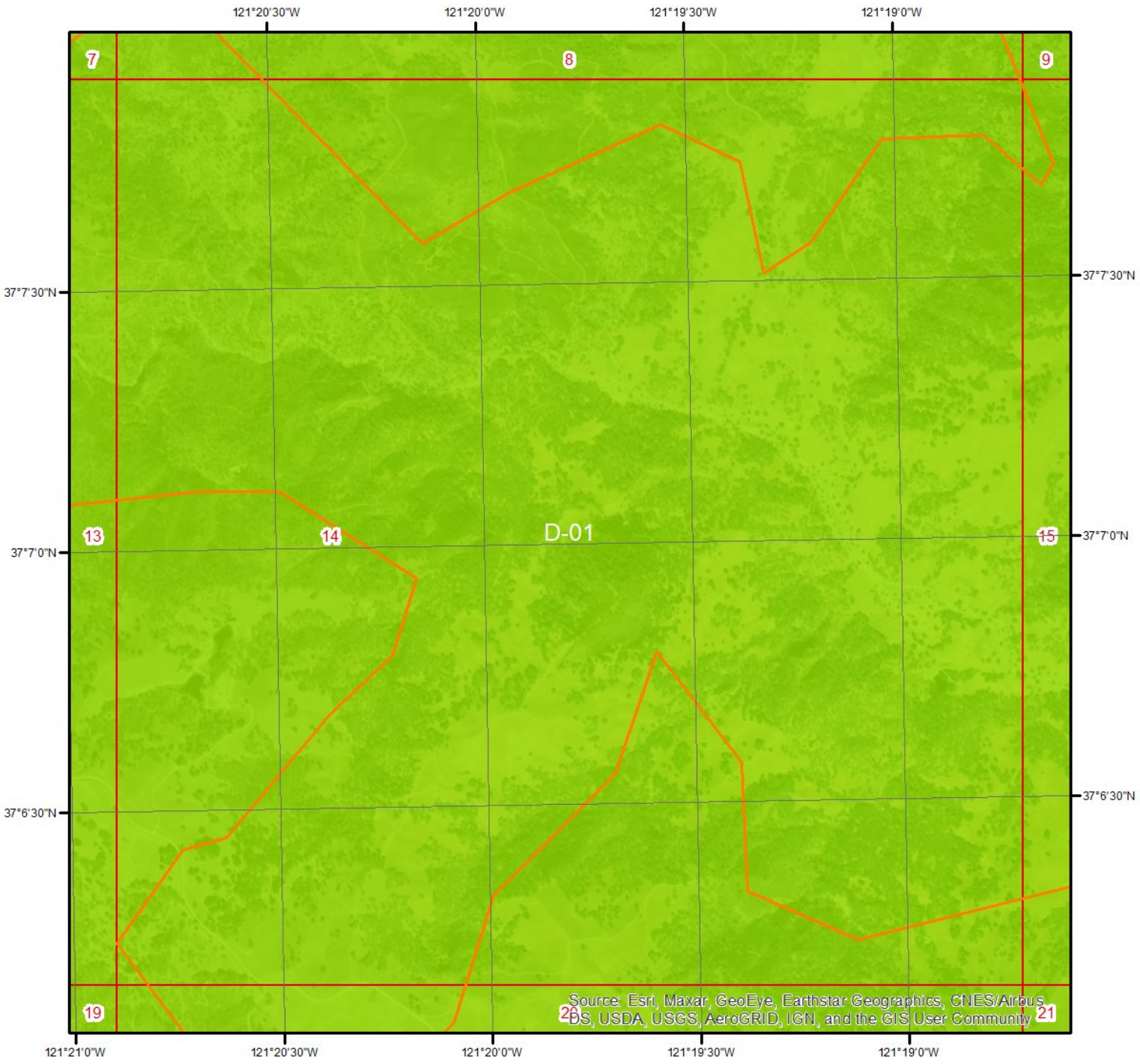
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Flood Hazard Zones - Page 14

This map shows FEMA flood hazard zones. FIRM panels are shown to the right, and blank indicates no data is available.

A	AO	X
A99	V	OPEN WATER
AE	VE	NOT POPULATED
AH	D	AREA NOT INCLUDED

Miles
0 0.2 0.4

N

06099C1025E
06085C0525H
06085C0700H

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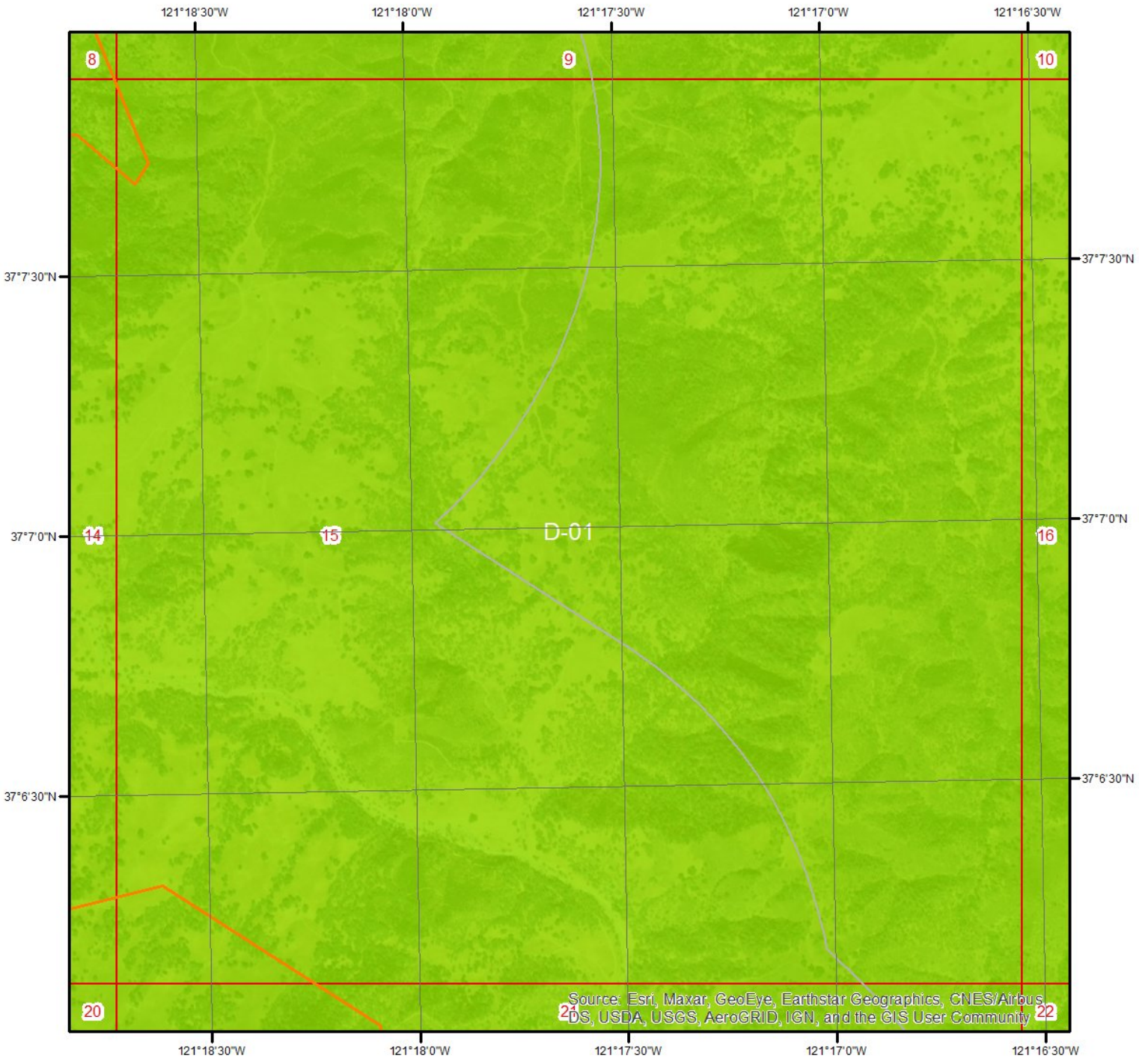
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Flood Hazard Zones - Page 15

This map shows FEMA flood hazard zones. FIRM panels are shown to the right, and blank indicates no data is available.

Miles
0 0.2 0.4

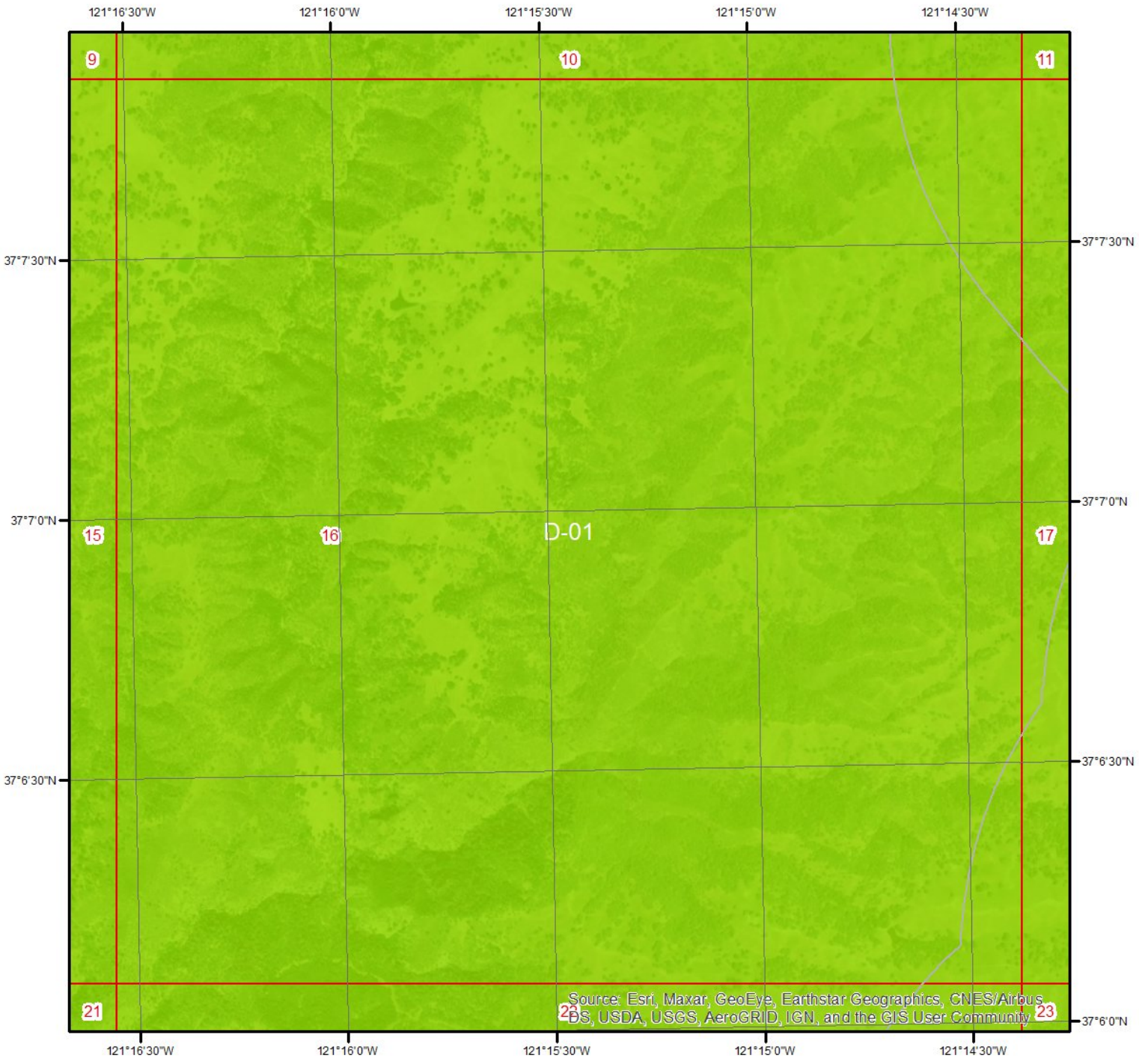
N

06099C1025E
06085C0525H
06085C0700H

A	AO	X
A99	V	OPEN WATER
AE	VE	NOT POPULATED
AH	D	AREA NOT INCLUDED

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Flood Hazard Zones - Page 16

This map shows FEMA flood hazard zones. FIRM panels are shown to the right, and blank indicates no data is available.

A	AO	X
A99	V	OPEN WATER
AE	VE	NOT POPULATED
AH	D	AREA NOT INCLUDED

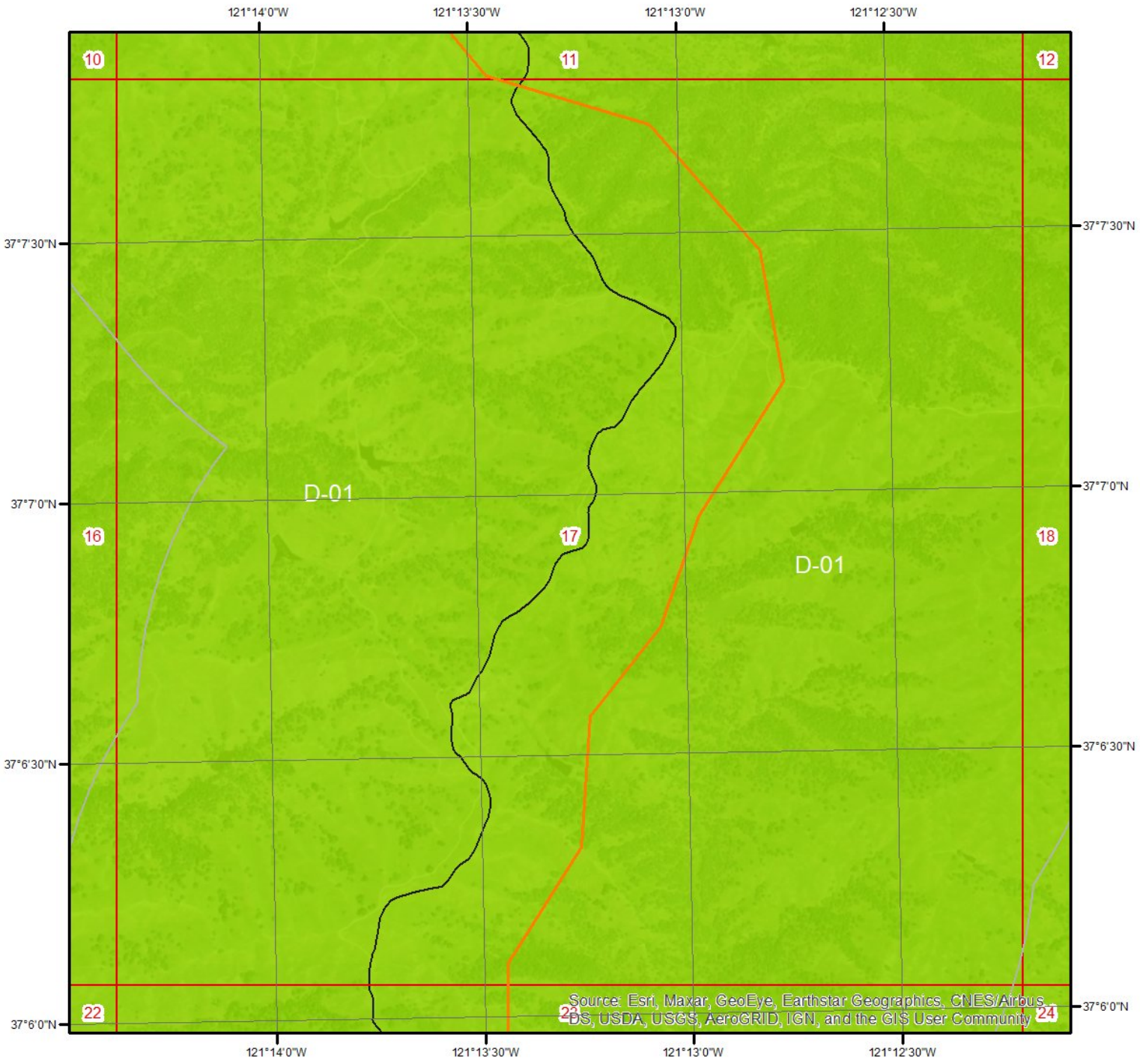
0 0.2 0.4 Miles

N

06099C1025E
06085C0700H
06085C0725H

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Flood Hazard Zones - Page 17

This map shows FEMA flood hazard zones. FIRM panels are shown to the right, and blank indicates no data is available.

A	AO	X
A99	V	OPEN WATER
AE	VE	NOT POPULATED
AH	D	AREA NOT INCLUDED

0 0.2 0.4 Miles

N

06099C1050E
~~06085C0550H~~
06085C0725H
06047C0775G

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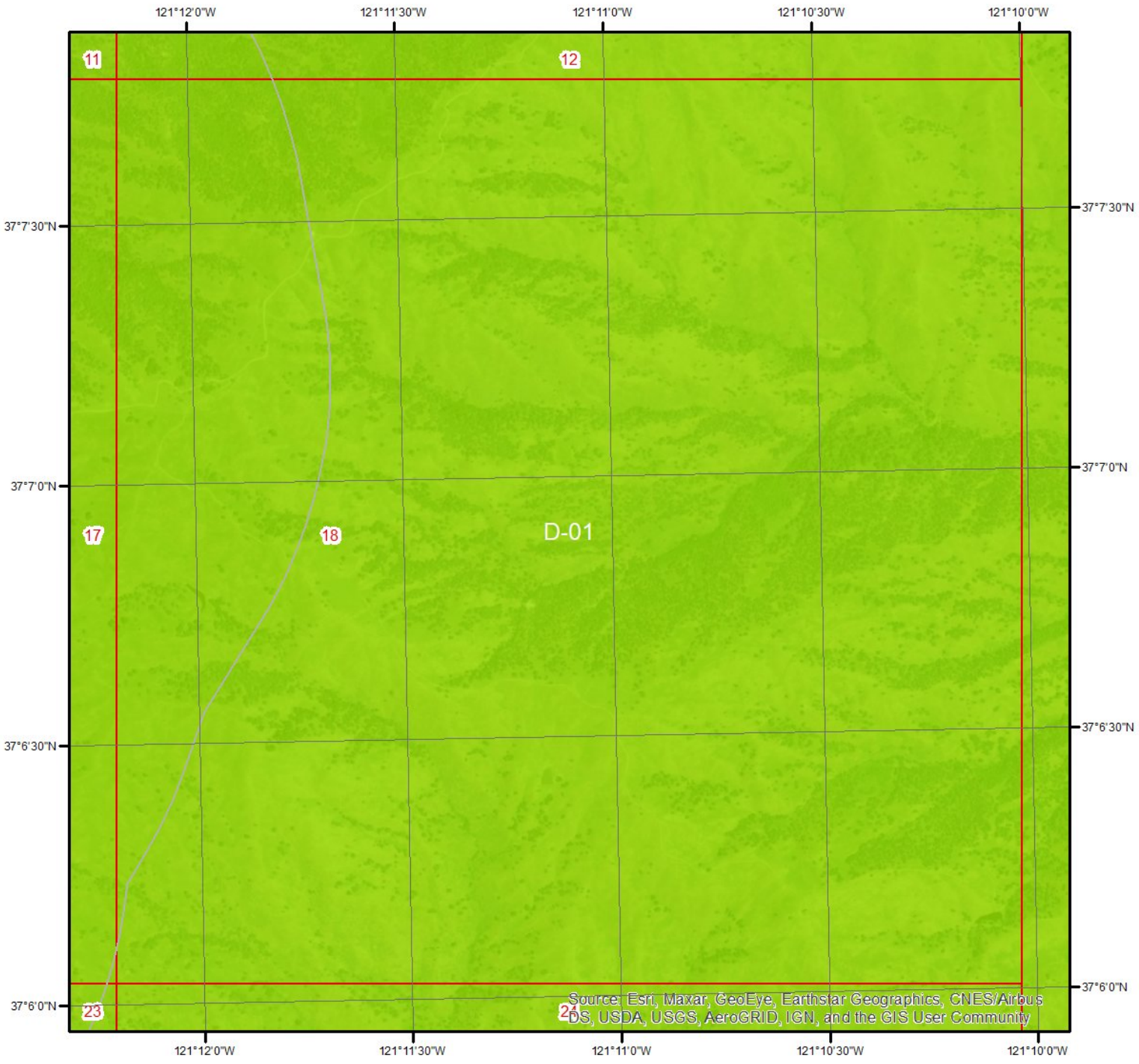
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Flood Hazard Zones - Page 18

This map shows FEMA flood hazard zones. FIRM panels are shown to the right, and blank indicates no data is available.

A	AO	X
A99	V	OPEN WATER
AE	VE	NOT POPULATED
AH	D	AREA NOT INCLUDED

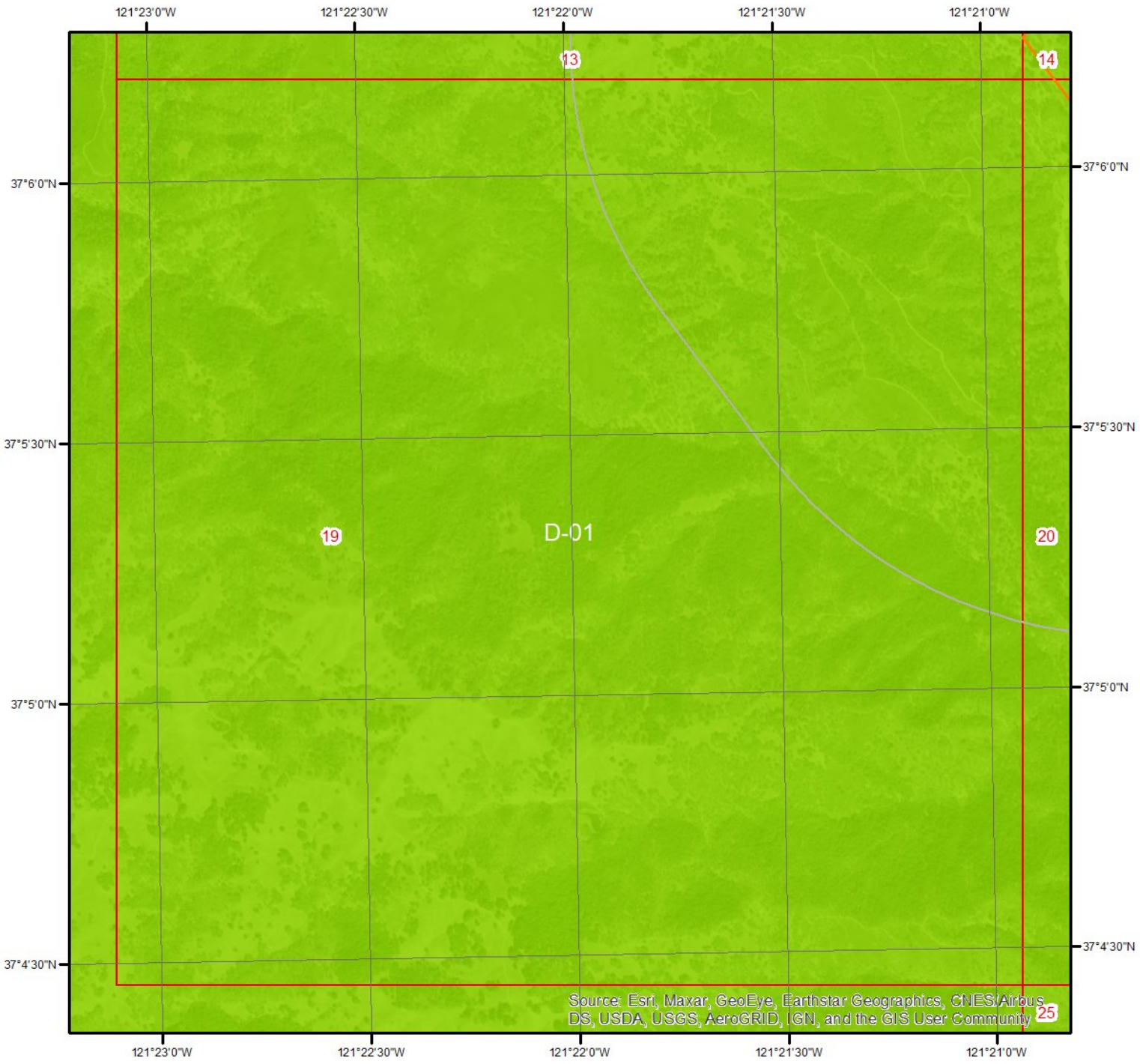
0 0.2 0.4 Miles

N

06099C1050E
~~06085C0550H~~
06085C0725H
06047C0775G

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Flood Hazard Zones - Page 19

This map shows FEMA flood hazard zones. FIRM panels are shown to the right, and blank indicates no data is available.

Miles
0 0.2 0.4

N

06085C0660H
06085C0700H

A	AO	X
A99	V	OPEN WATER
AE	VE	NOT POPULATED
AH	D	AREA NOT INCLUDED

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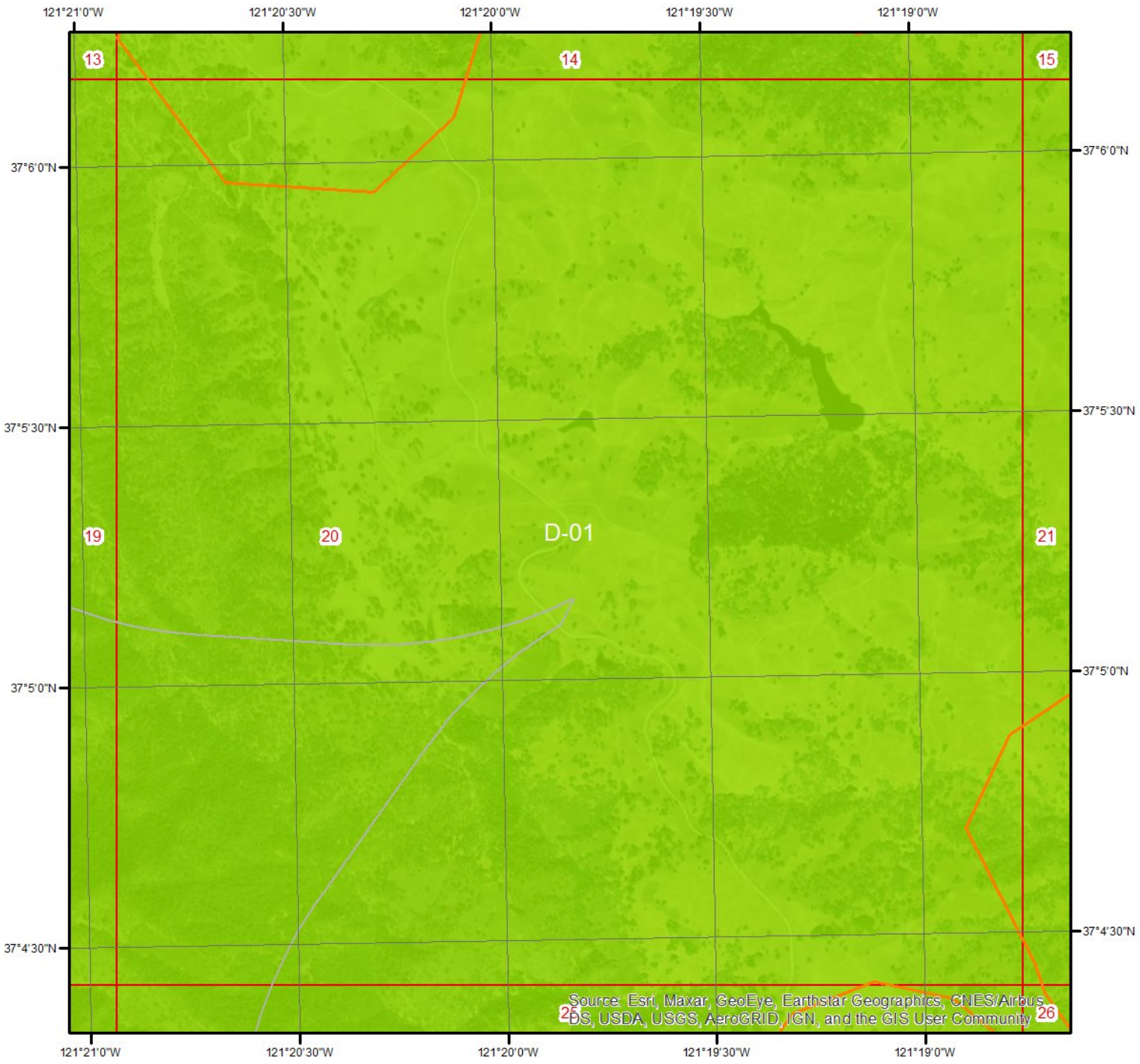
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Flood Hazard Zones - Page 20

This map shows FEMA flood hazard zones. FIRM panels are shown to the right, and blank indicates no data is available.

Miles
0 0.2 0.4

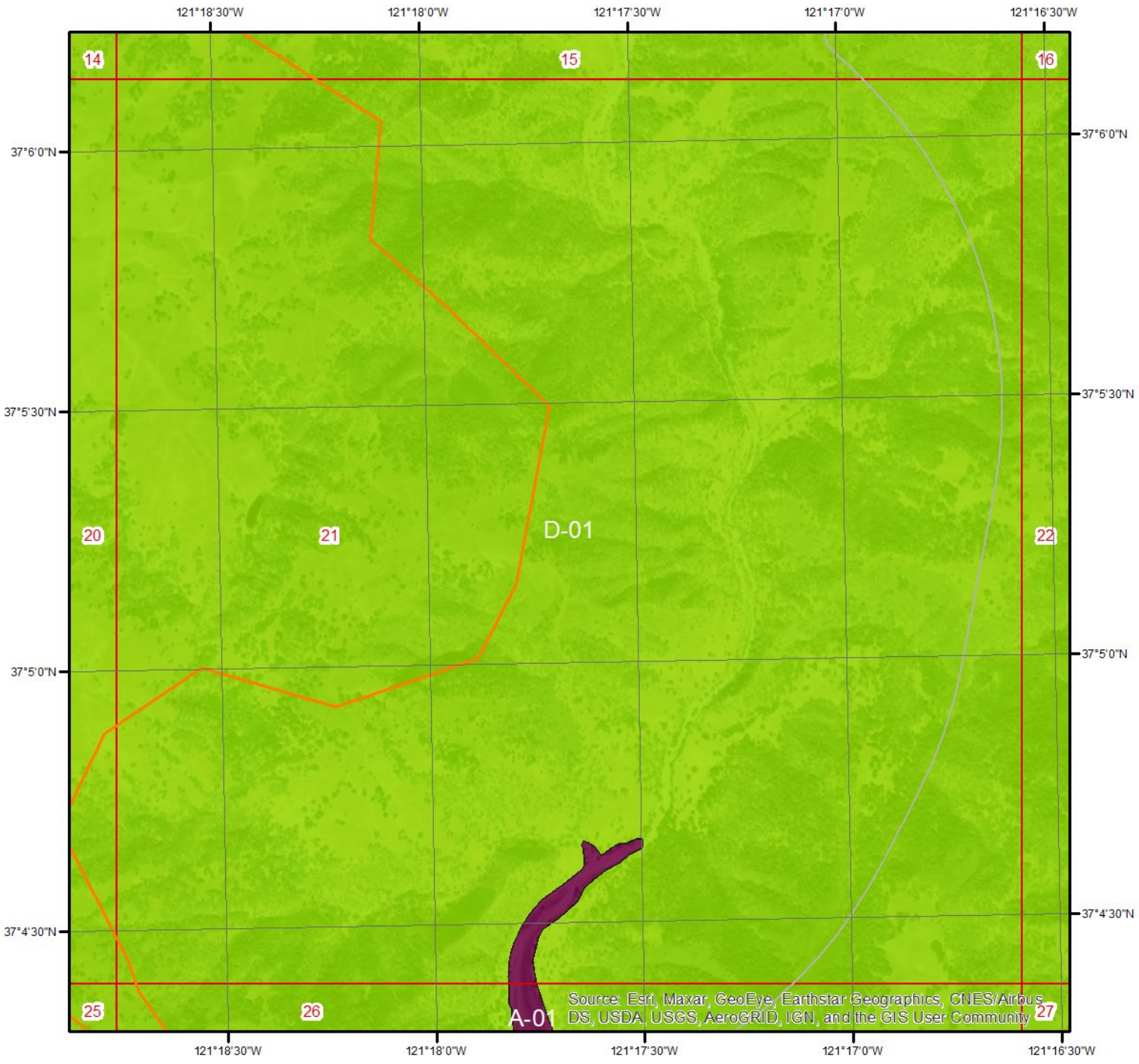
N

06085C0700H

A	AO	X
A99	V	OPEN WATER
AE	VE	NOT POPULATED
AH	D	AREA NOT INCLUDED

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Flood Hazard Zones - Page 21

This map shows FEMA flood hazard zones. FIRM panels are shown to the right, and blank indicates no data is available.

Miles
0 0.2 0.4

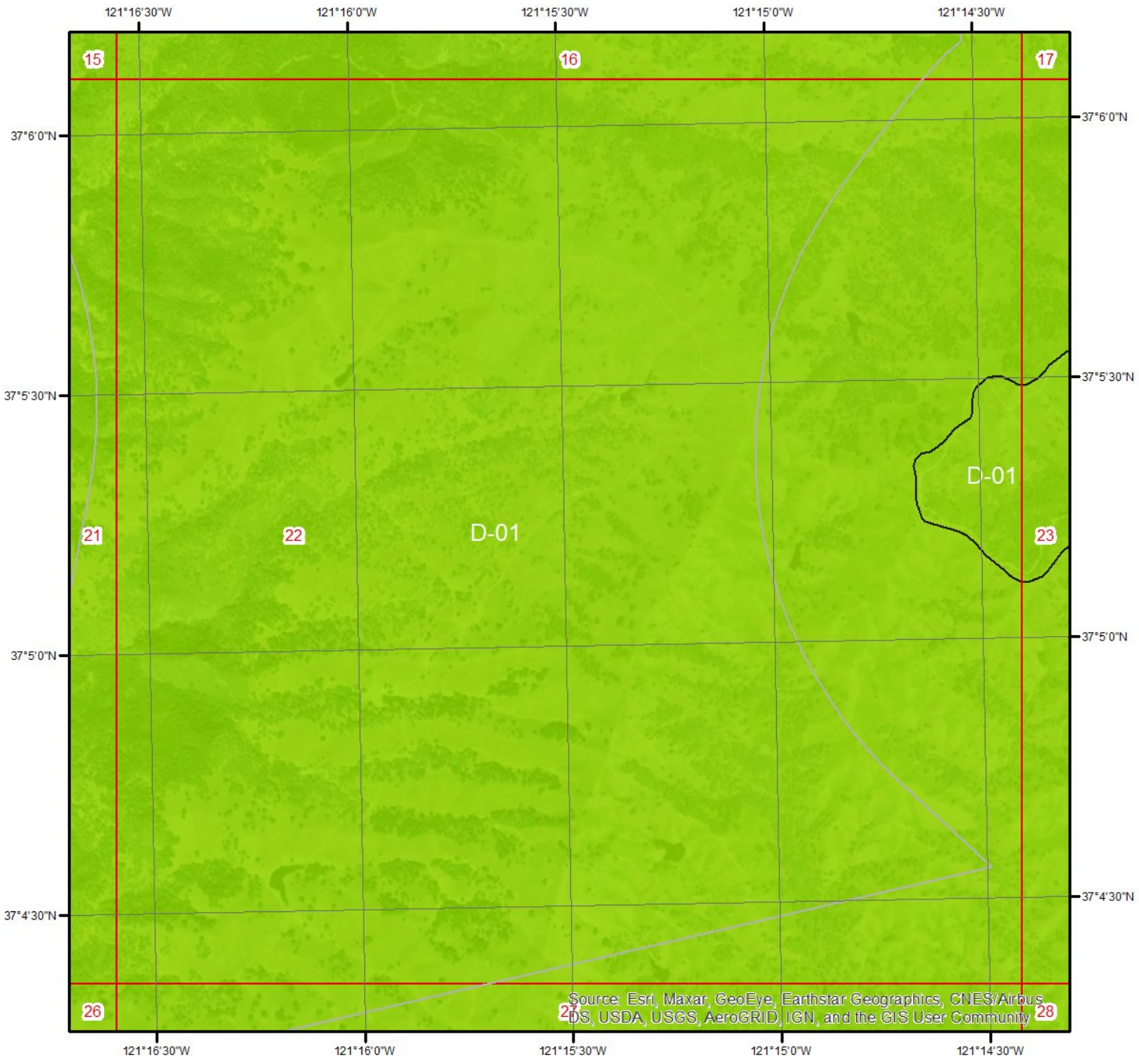
N

06085C0700H

A	AO	X
A99	V	OPEN WATER
AE	VE	NOT POPULATED
AH	D	AREA NOT INCLUDED

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Flood Hazard Zones - Page 22

This map shows FEMA flood hazard zones. FIRM panels are shown to the right, and blank indicates no data is available.

Miles
0 0.2 0.4

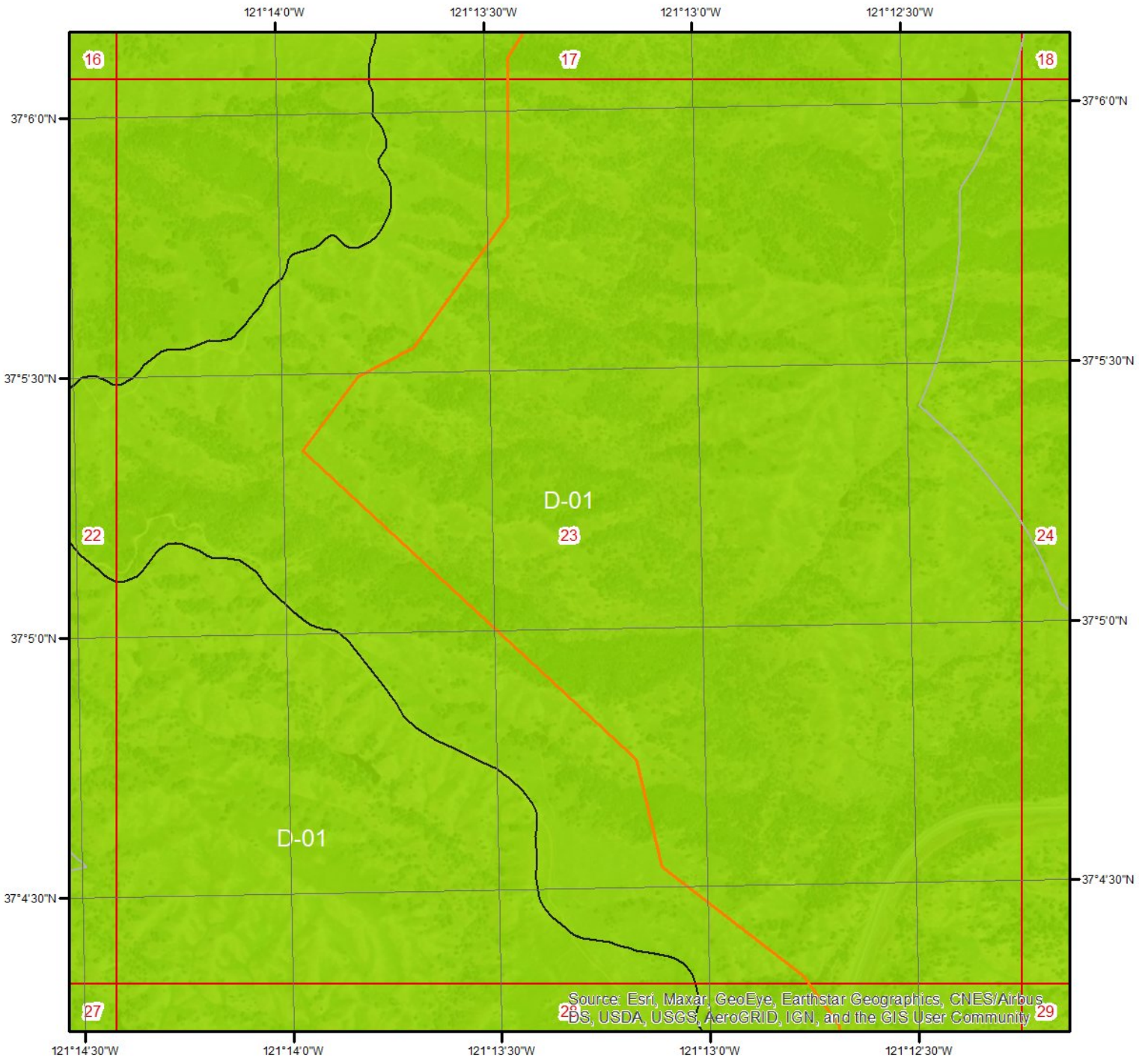
N

06085C0700H
06085C0725H

A	AO	X
A99	V	OPEN WATER
AE	VE	NOT POPULATED
AH	D	AREA NOT INCLUDED

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Flood Hazard Zones - Page 23

This map shows FEMA flood hazard zones. FIRM panels are shown to the right, and blank indicates no data is available.

Miles
0 0.2 0.4

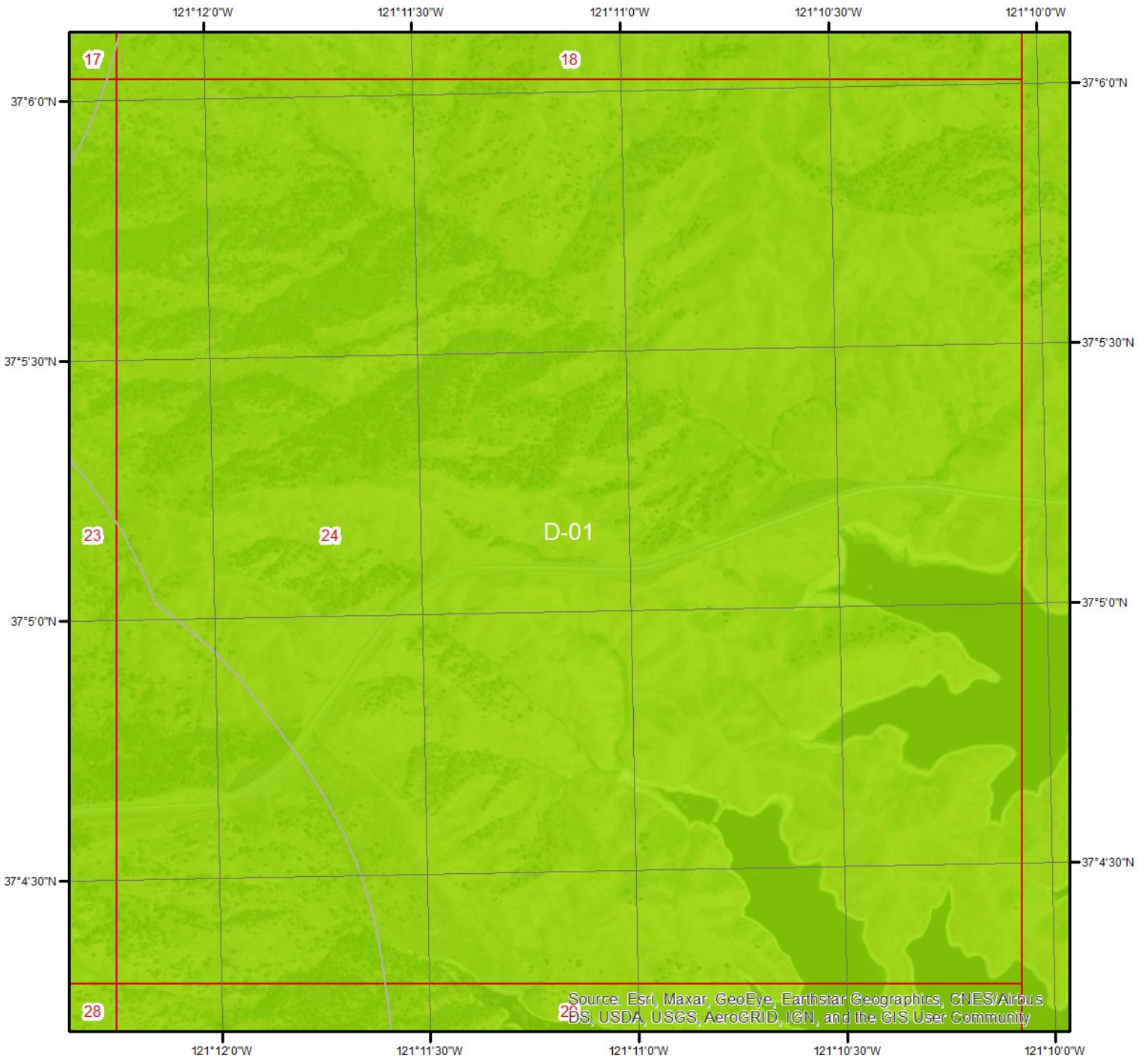
N

06085C0725H
06047C0775G

A	AO	X
A99	V	OPEN WATER
AE	VE	NOT POPULATED
AH	D	AREA NOT INCLUDED

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Flood Hazard Zones - Page 24

This map shows FEMA flood hazard zones. FIRM panels are shown to the right, and blank indicates no data is available.

A	AO	X
A99	V	OPEN WATER
AE	VE	NOT POPULATED
AH	D	AREA NOT INCLUDED

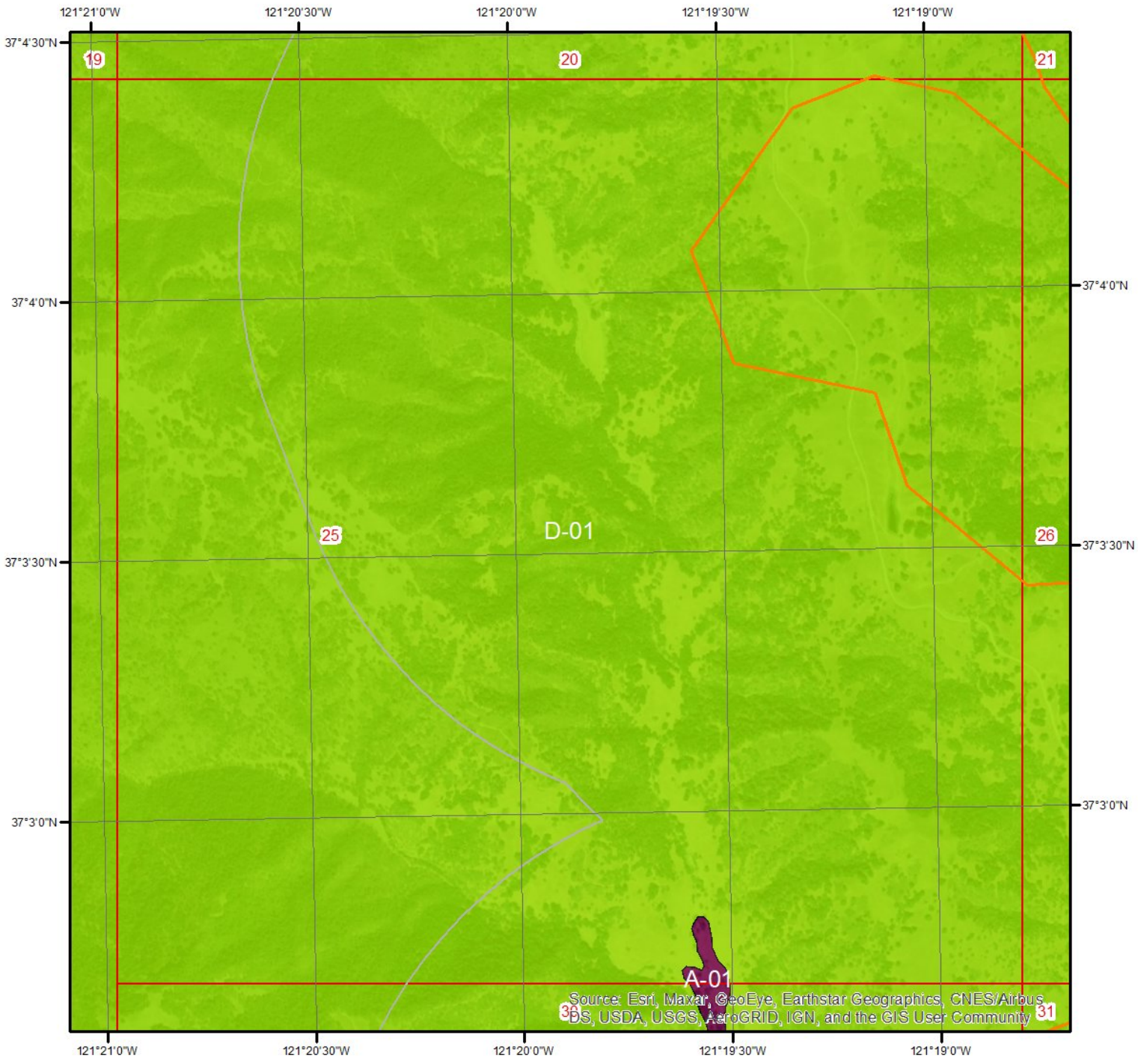
0 0.2 0.4 Miles

N

06085C0725H
06047C0775G

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Flood Hazard Zones - Page 25

This map shows FEMA flood hazard zones. FIRM panels are shown to the right, and blank indicates no data is available.

Miles
0 0.2 0.4

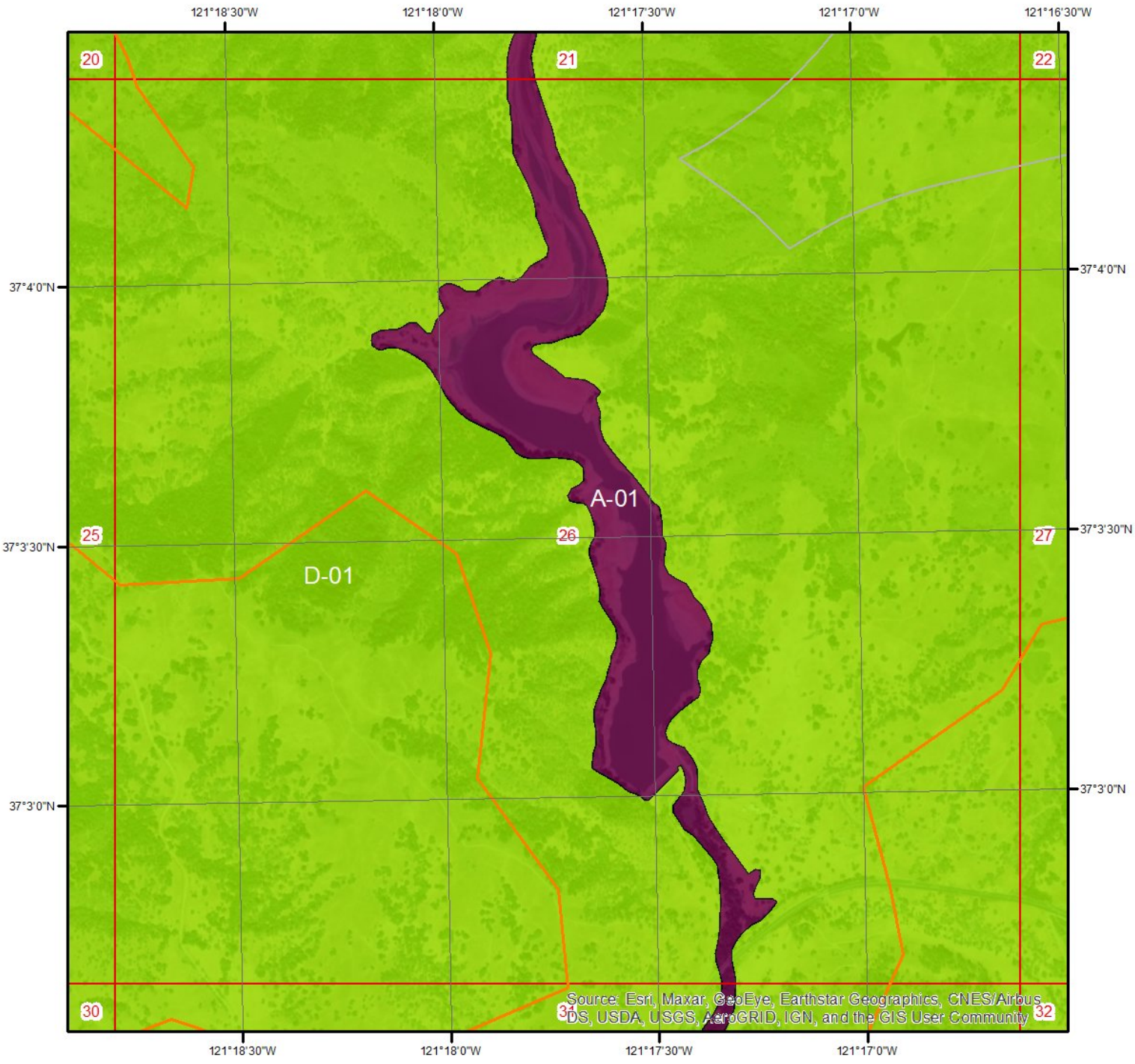
N

06085C0700H

A	AO	X
A99	V	OPEN WATER
AE	VE	NOT POPULATED
AH	D	AREA NOT INCLUDED

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Flood Hazard Zones - Page 26

This map shows FEMA flood hazard zones. FIRM panels are shown to the right, and blank indicates no data is available.

Miles
0 0.2 0.4

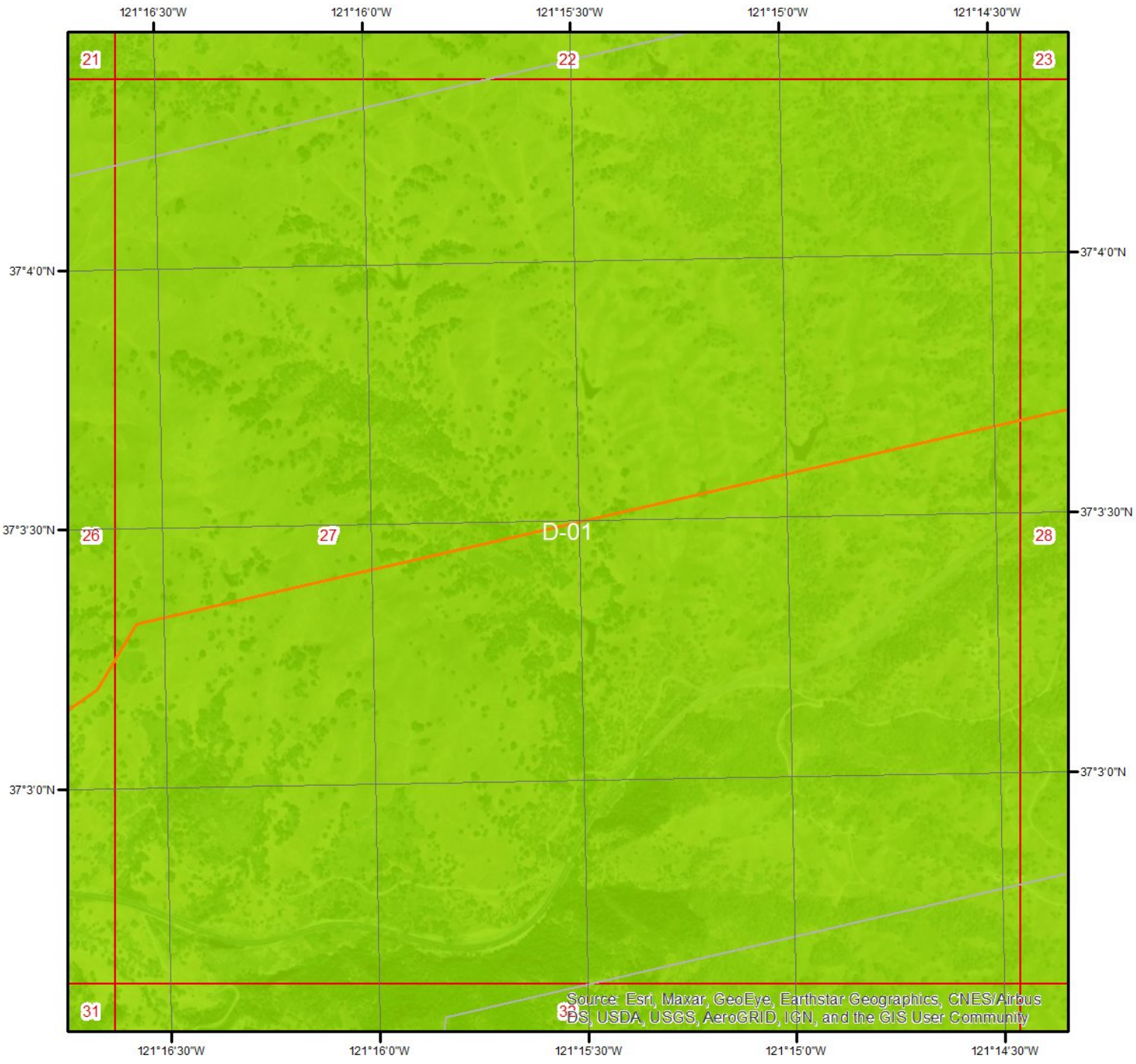
N

06085C0700H

A	AO	X
A99	V	OPEN WATER
AE	VE	NOT POPULATED
AH	D	AREA NOT INCLUDED

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Flood Hazard Zones - Page 27

This map shows FEMA flood hazard zones. FIRM panels are shown to the right, and blank indicates no data is available.

Miles
0 0.2 0.4

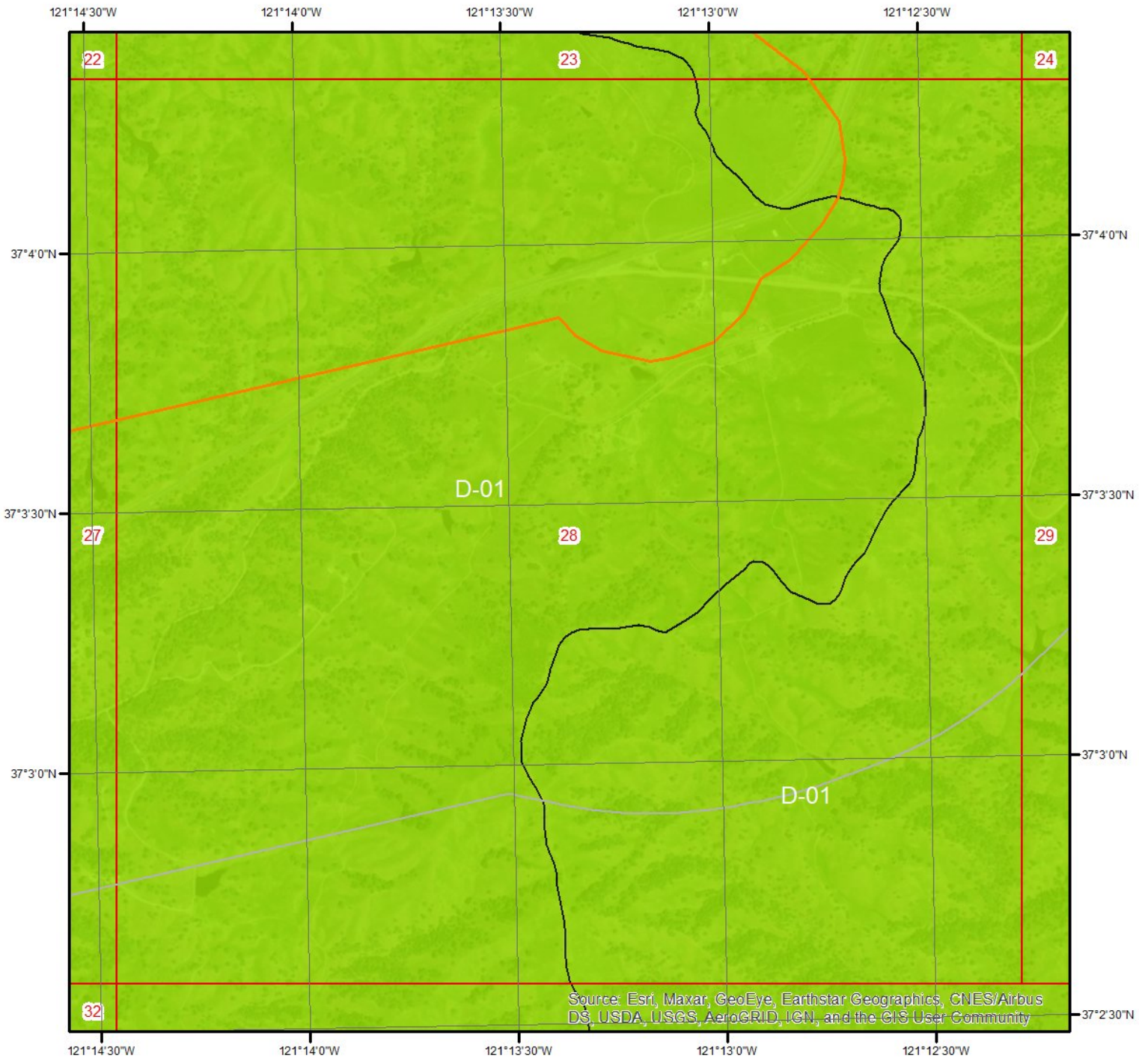
N

06085C0700H
06085C0725H

A	AO	X
A99	V	OPEN WATER
AE	VE	NOT POPULATED
AH	D	AREA NOT INCLUDED

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Flood Hazard Zones - Page 28

This map shows FEMA flood hazard zones. FIRM panels are shown to the right, and blank indicates no data is available.

Miles
0 0.2 0.4

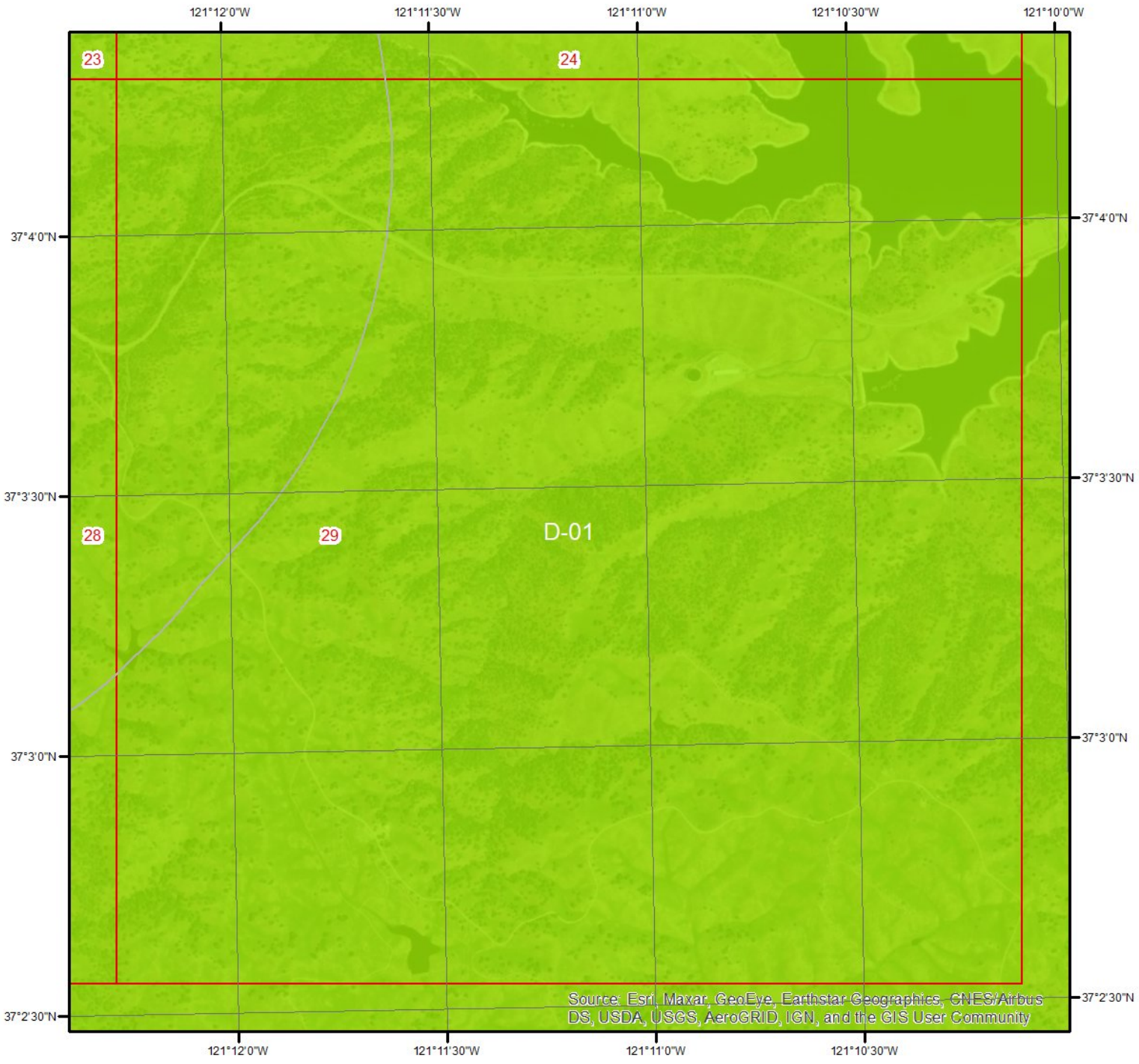
N

06085C0725H
06047C0775G

A	AO	X
A99	V	OPEN WATER
AE	VE	NOT POPULATED
AH	D	AREA NOT INCLUDED

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Flood Hazard Zones - Page 29

This map shows FEMA flood hazard zones. FIRM panels are shown to the right, and blank indicates no data is available.

A	AO	X
A99	V	OPEN WATER
AE	VE	NOT POPULATED
AH	D	AREA NOT INCLUDED

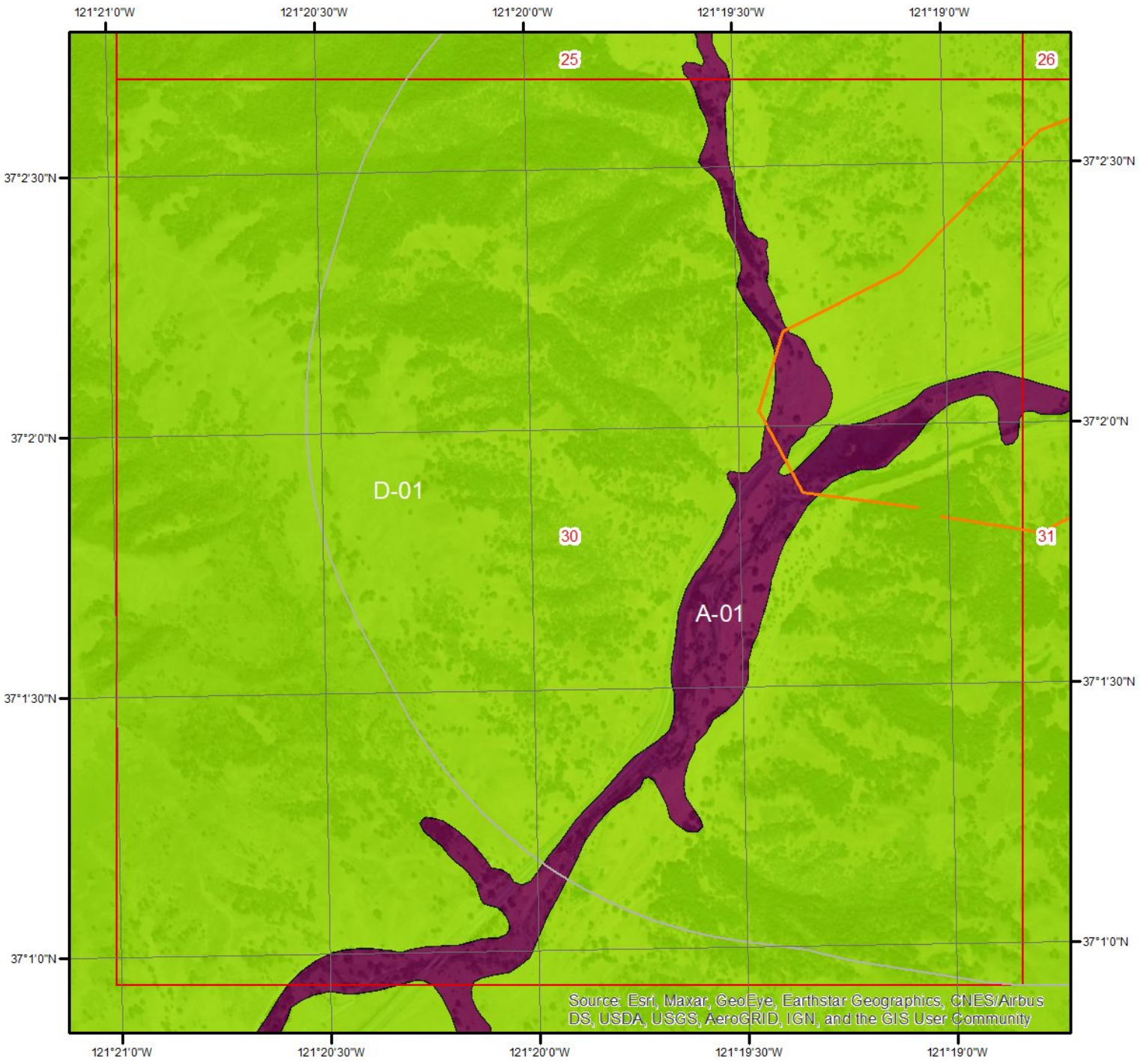
0 0.2 0.4 Miles

N

06085C0725H
06047C0775G

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Flood Hazard Zones - Page 30

This map shows FEMA flood hazard zones. FIRM panels are shown to the right, and blank indicates no data is available.

Miles
0 0.2 0.4

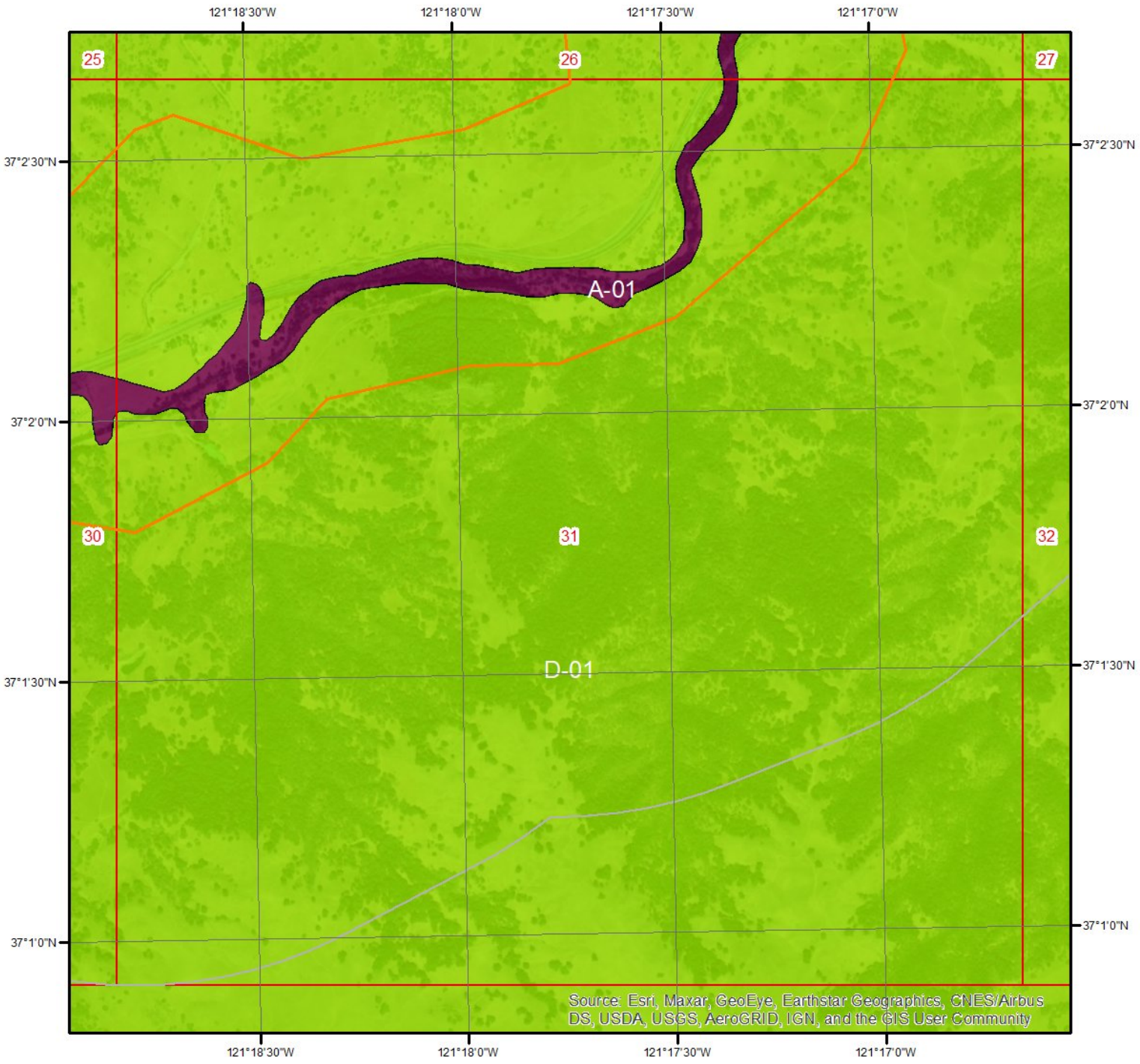
N

06085C0700H

A	AO	X
A99	V	OPEN WATER
AE	VE	NOT POPULATED
AH	D	AREA NOT INCLUDED

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Flood Hazard Zones - Page 31

This map shows FEMA flood hazard zones. FIRM panels are shown to the right, and blank indicates no data is available.

Miles
0 0.2 0.4

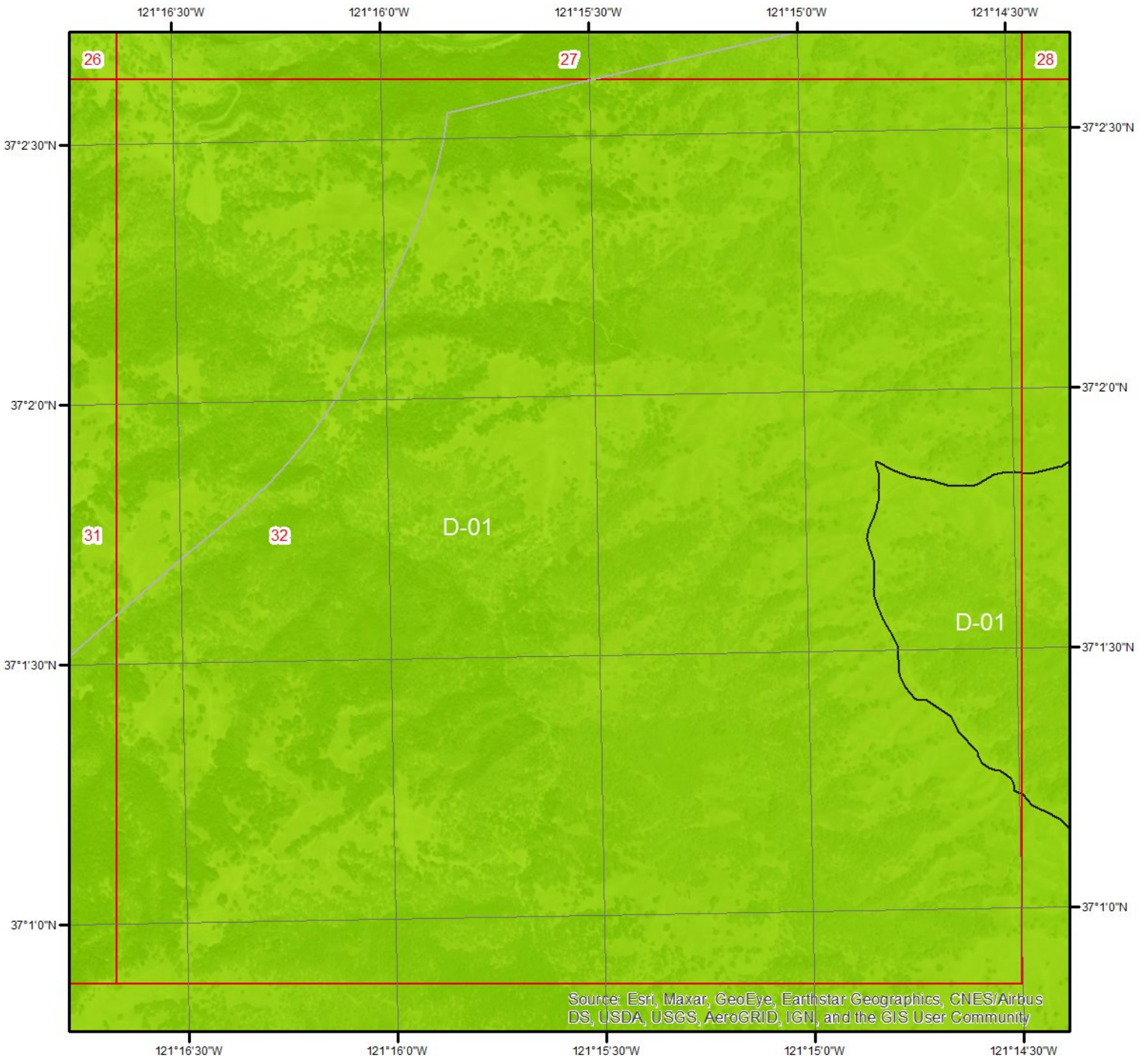
N

06085C0700H

A	AO	X
A99	V	OPEN WATER
AE	VE	NOT POPULATED
AH	D	AREA NOT INCLUDED

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Hydrologic Information



Flood Hazard Zones - Page 32

This map shows FEMA flood hazard zones. FIRM panels are shown to the right, and blank indicates no data is available.

Miles
0 0.2 0.4

N

06085C0700H
06085C0725H

A	AO	X
A99	V	OPEN WATER
AE	VE	NOT POPULATED
AH	D	AREA NOT INCLUDED

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Hydrologic Information

The Wetland Type map shows wetland existence overlaid on an aerial imagery. The Flood Hazard Zones map shows FEMA flood hazard zones overlaid on an aerial imagery. Relevant FIRM panels and detailed zone information is provided below.

Available FIRM Panels in area:	06085C0525H(effective:2009-05-18) 06085C0500H(effective:2009-05-18) 06047C0525G(effective:2008-12-02) 06047C0775G(effective:2008-12-02) 06085C0550H(effective:2009-05-18) 06085C0660H(effective:2009-05-18) 06085C0725H(effective:2009-05-18) 06085C0700H(effective:2009-05-18) 06099C1000E(effective:2008-09-26) 06099C1050E(effective:2008-09-26) 06099C1025E(effective:2008-09-26)

Flood Zone A-01

Zone:	A
Zone subtype:	

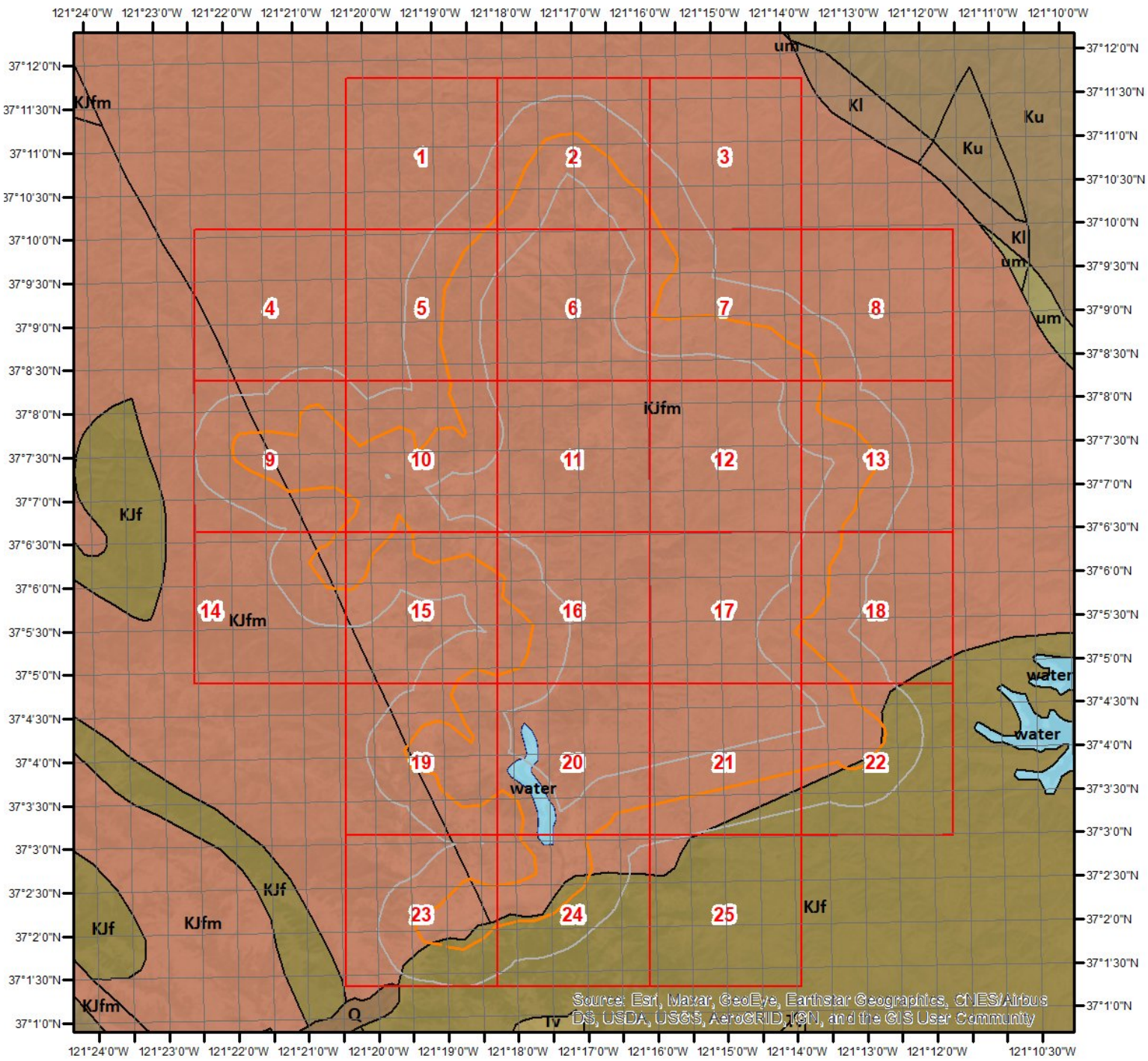
Flood Zone D-01

Zone:	D
Zone subtype:	

Flood Zone X-12

Zone:	X
Zone subtype:	AREA OF MINIMAL FLOOD HAZARD

Geologic Information



Miles

0 0.2 0.4 0.8 1.2 1.6 2 2.4

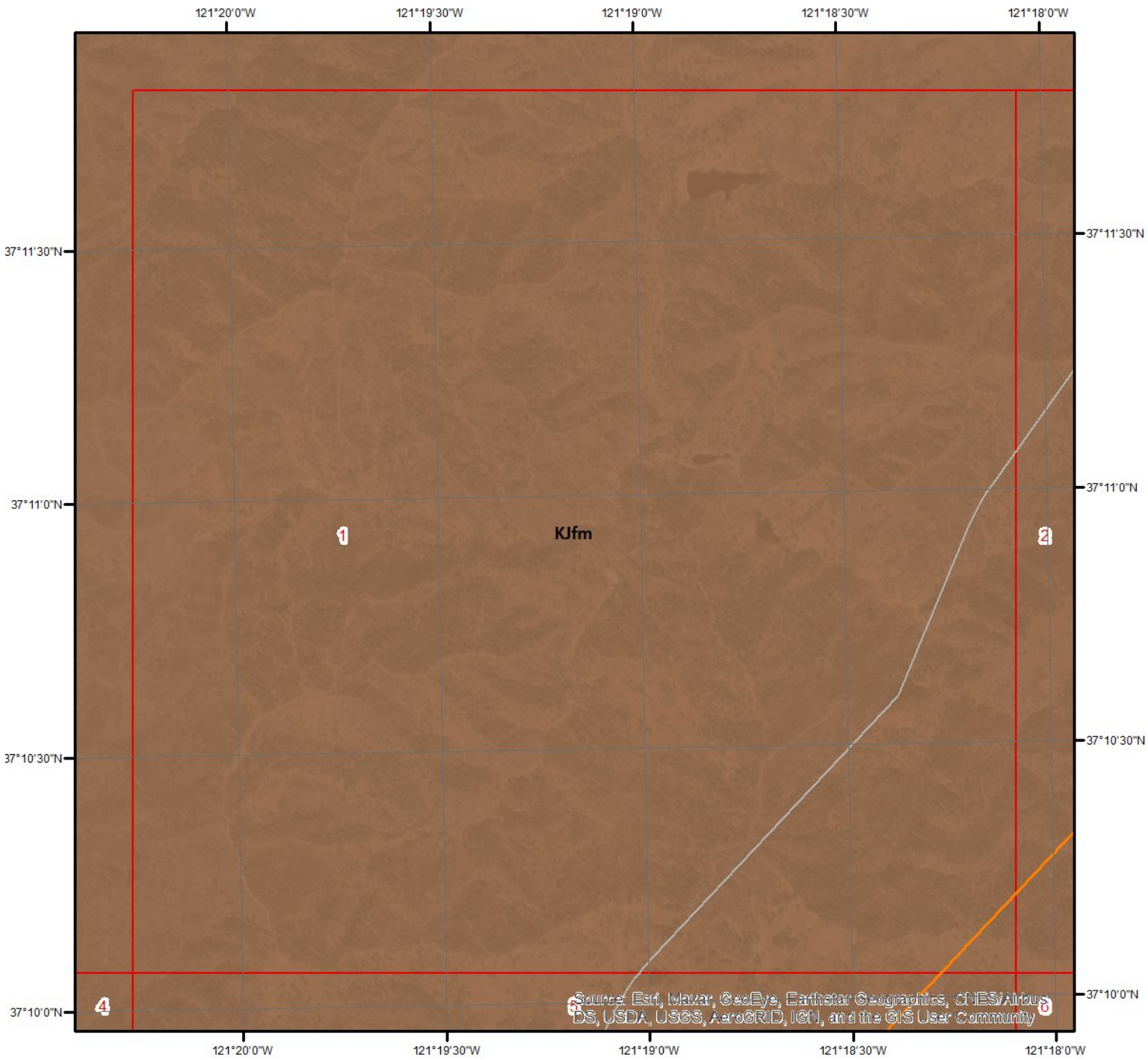
N

Geologic Units

This maps shows geologic units in the area. Please refer to the report for detailed descriptions.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Geologic Information



Miles
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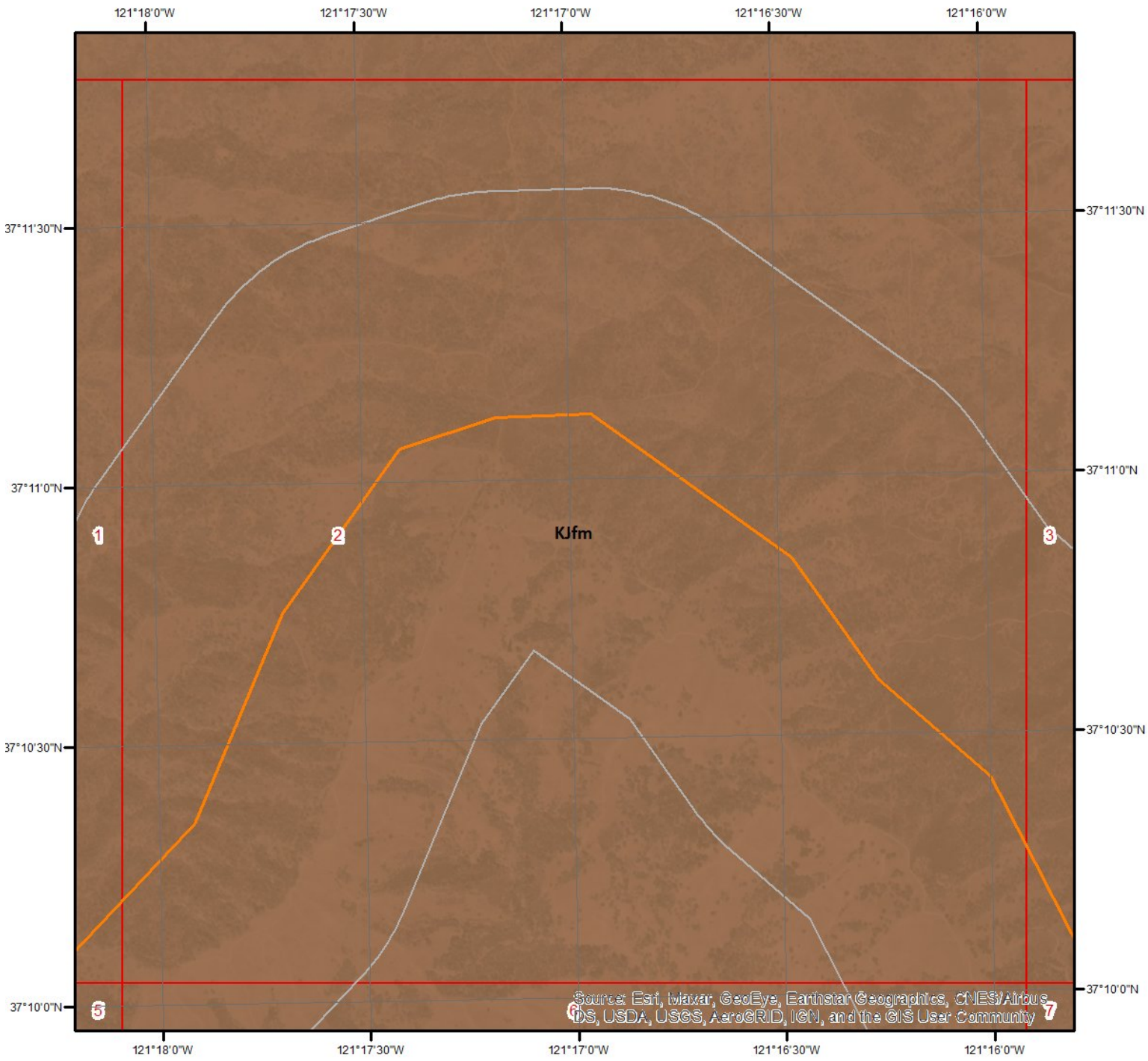
Geologic Units - Page 1

This maps shows geologic units in the area. Please refer to the report for detailed descriptions.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Geologic Information



Miles
0 0.2 0.4

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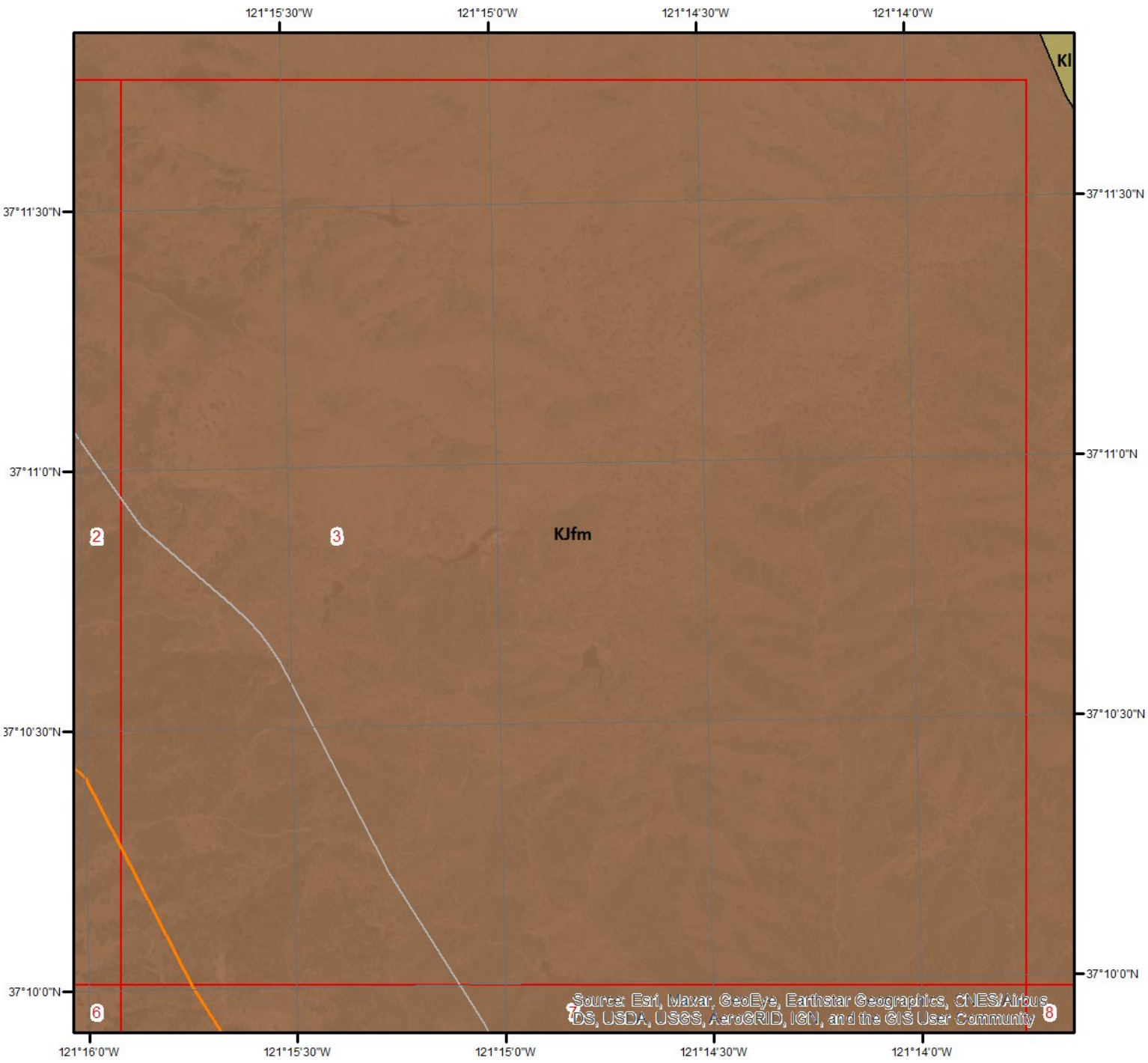
Geologic Units - Page 2

This maps shows geologic units in the area. Please refer to the report for detailed descriptions.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Geologic Information



Miles
0 0.2 0.4

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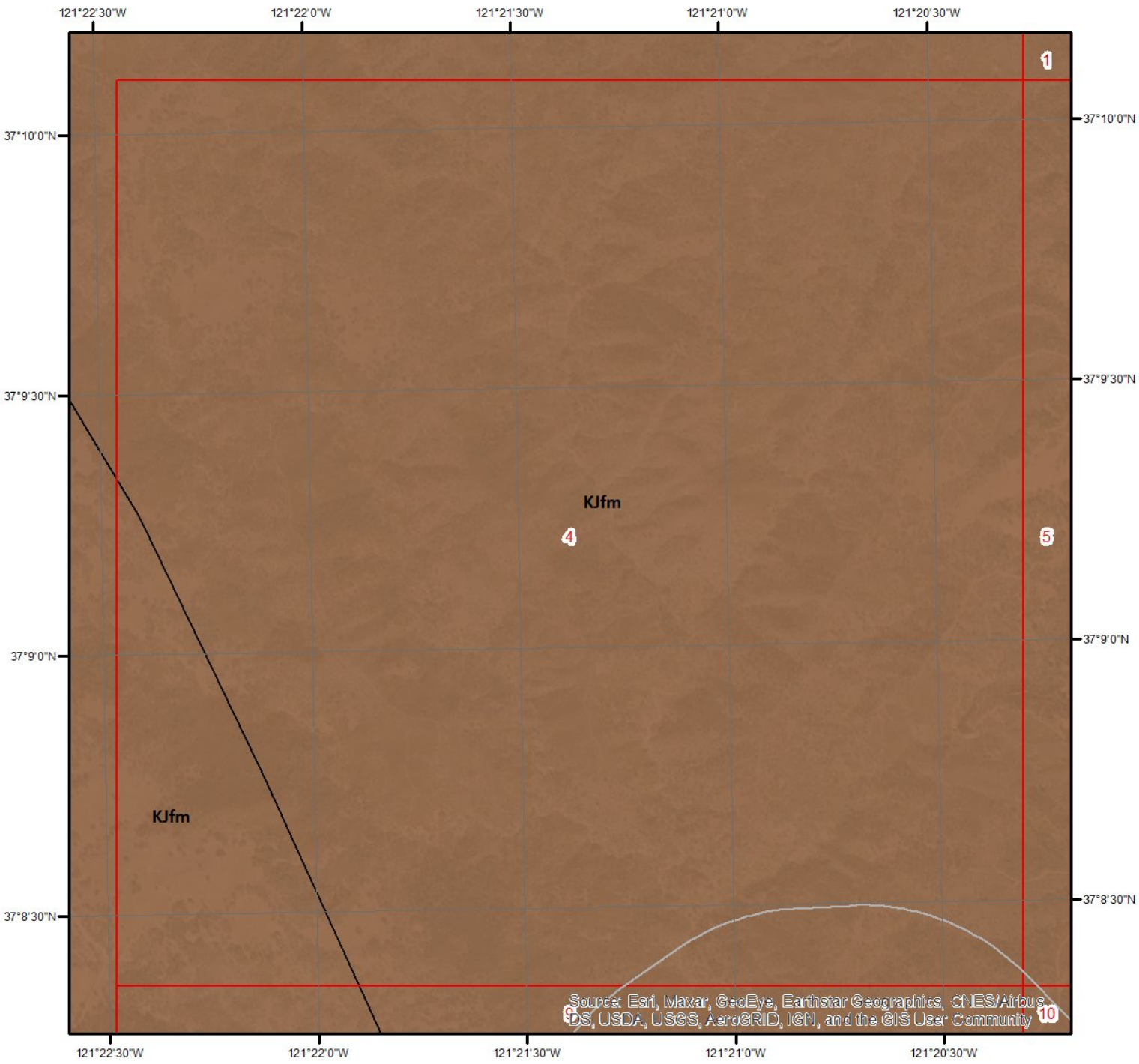
Geologic Units - Page 3

This maps shows geologic units in the area. Please refer to the report for detailed descriptions.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Geologic Information

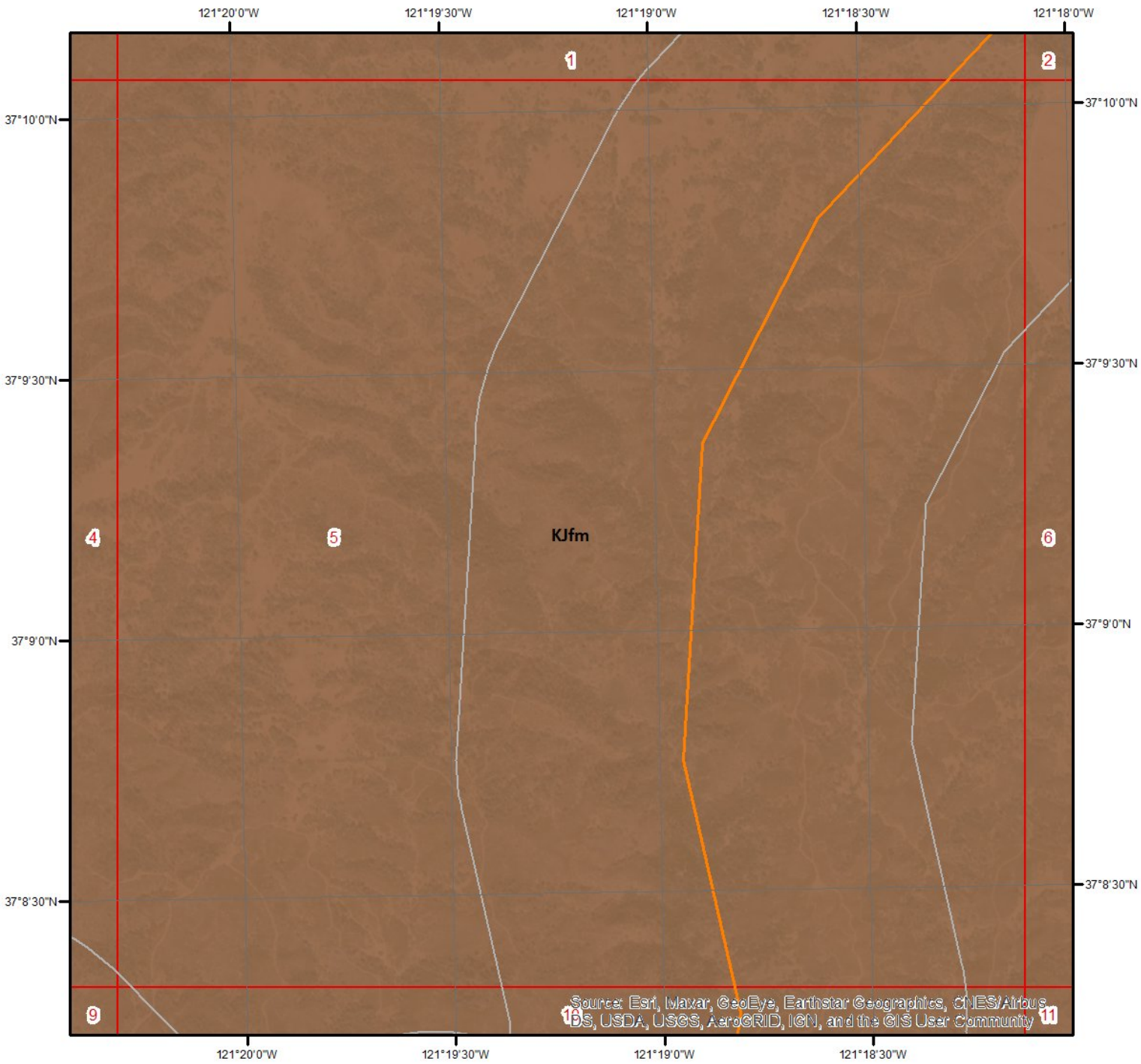


Geologic Units - Page 4

This maps shows geologic units in the area. Please refer to the report for detailed descriptions.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Geologic Information



Miles
0 0.2 0.4

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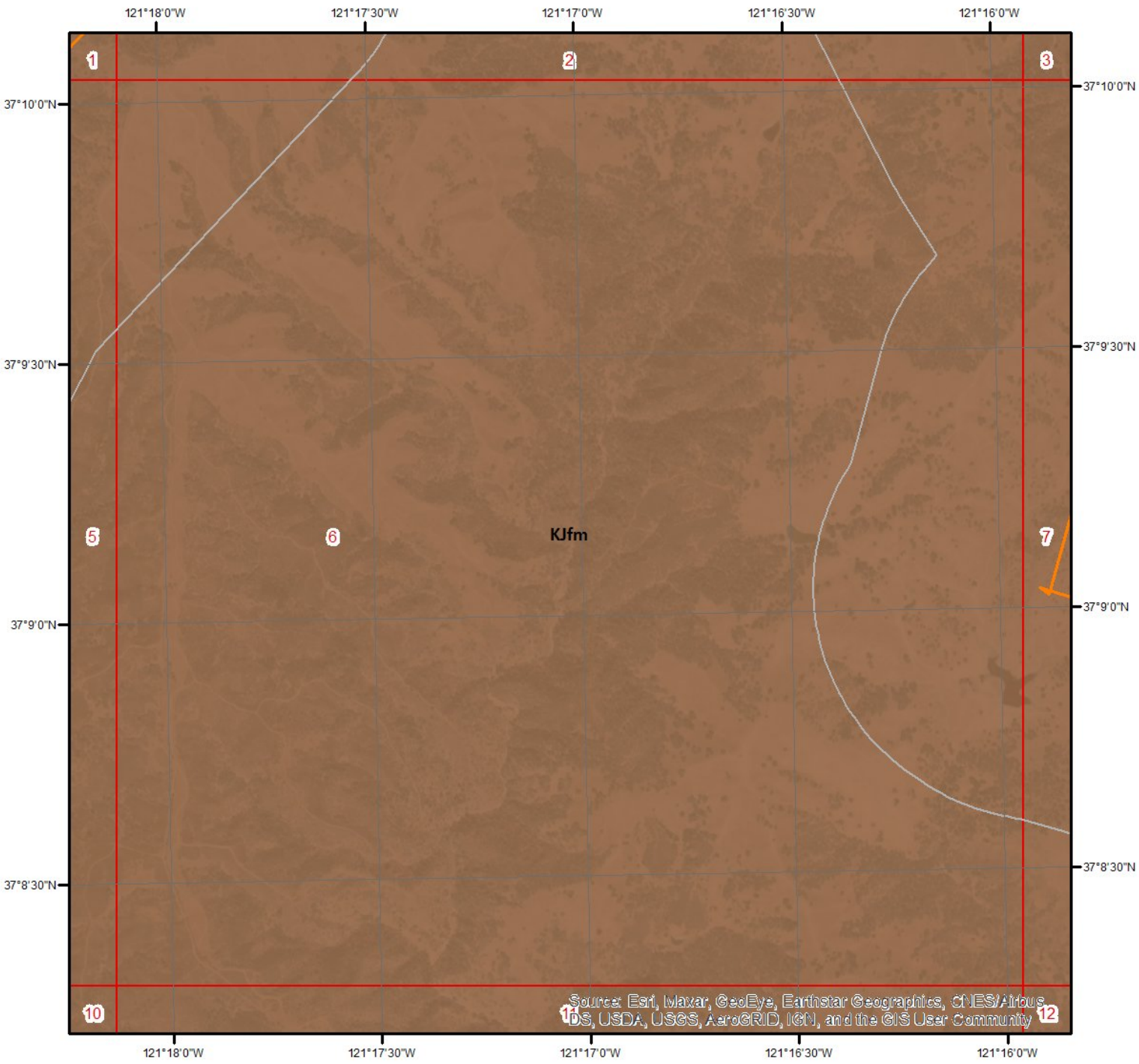
Geologic Units - Page 5

This maps shows geologic units in the area. Please refer to the report for detailed descriptions.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Geologic Information



Miles
0 0.2 0.4

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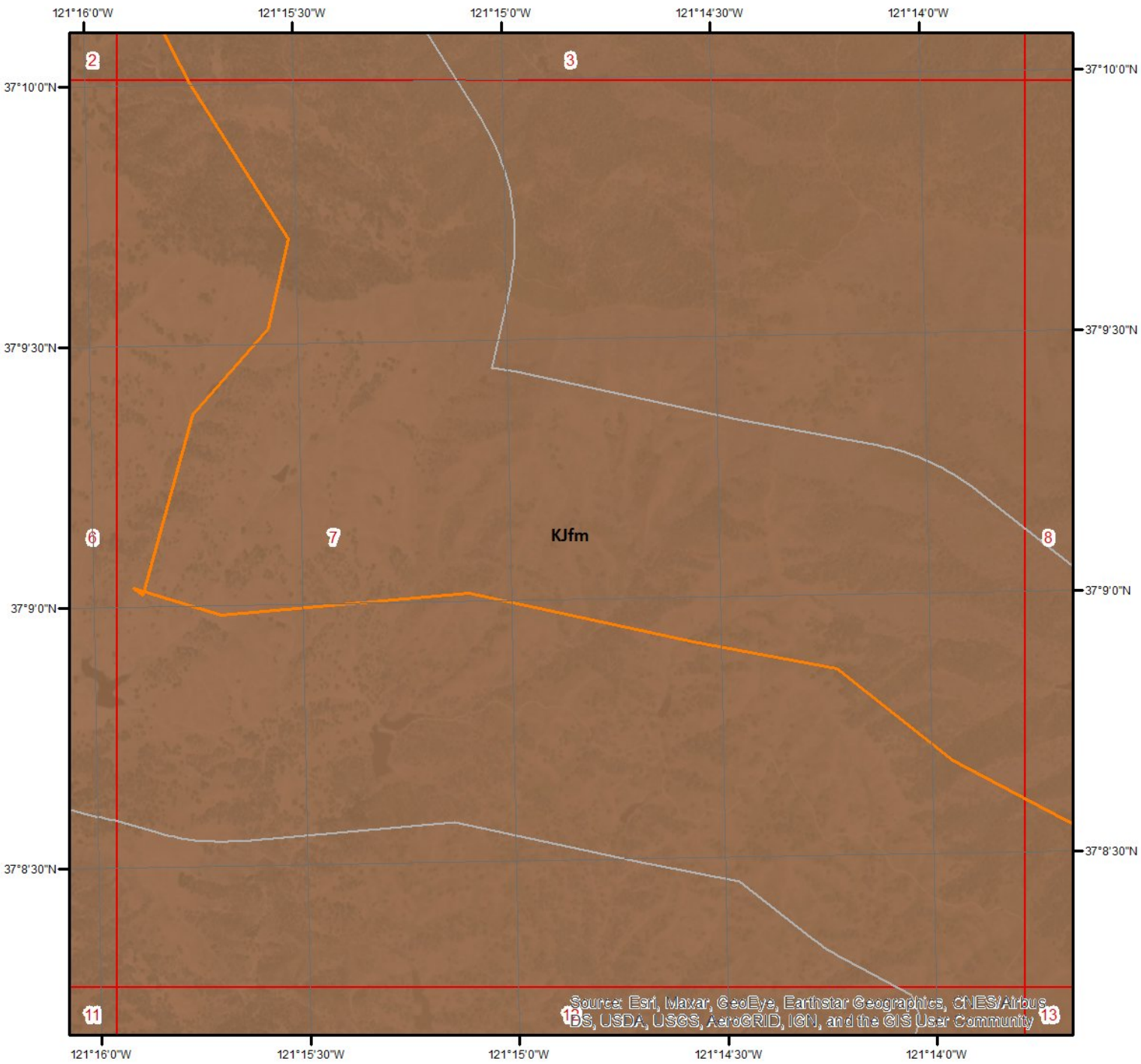
Geologic Units - Page 6

This maps shows geologic units in the area. Please refer to the report for detailed descriptions.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Geologic Information



Miles
0 0.2 0.4

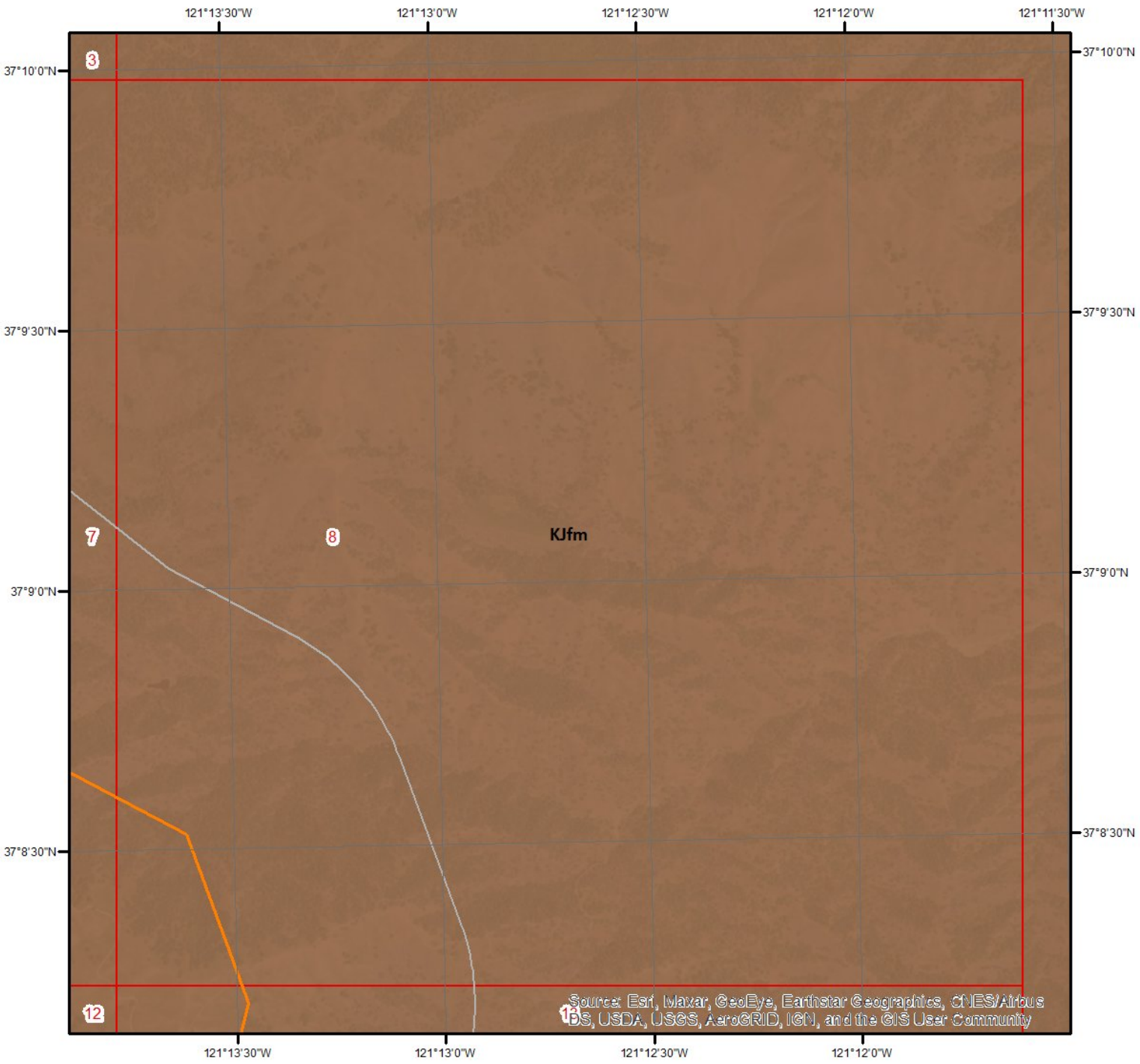
N

Geologic Units - Page 7

This maps shows geologic units in the area. Please refer to the report for detailed descriptions.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Geologic Information



Miles
0 0.2 0.4

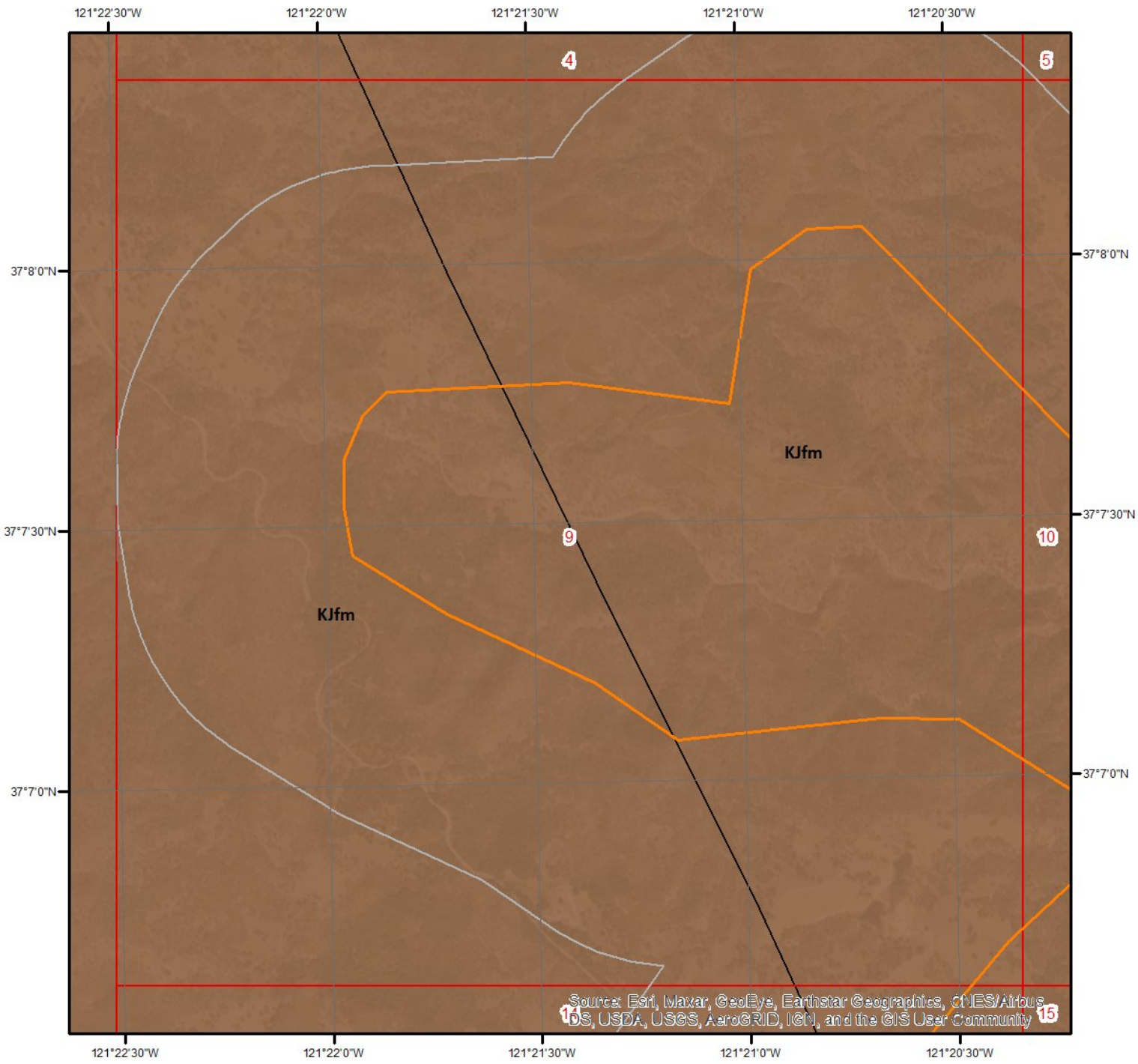
N

Geologic Units - Page 8

This maps shows geologic units in the area. Please refer to the report for detailed descriptions.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Geologic Information



Miles
0 0.2 0.4

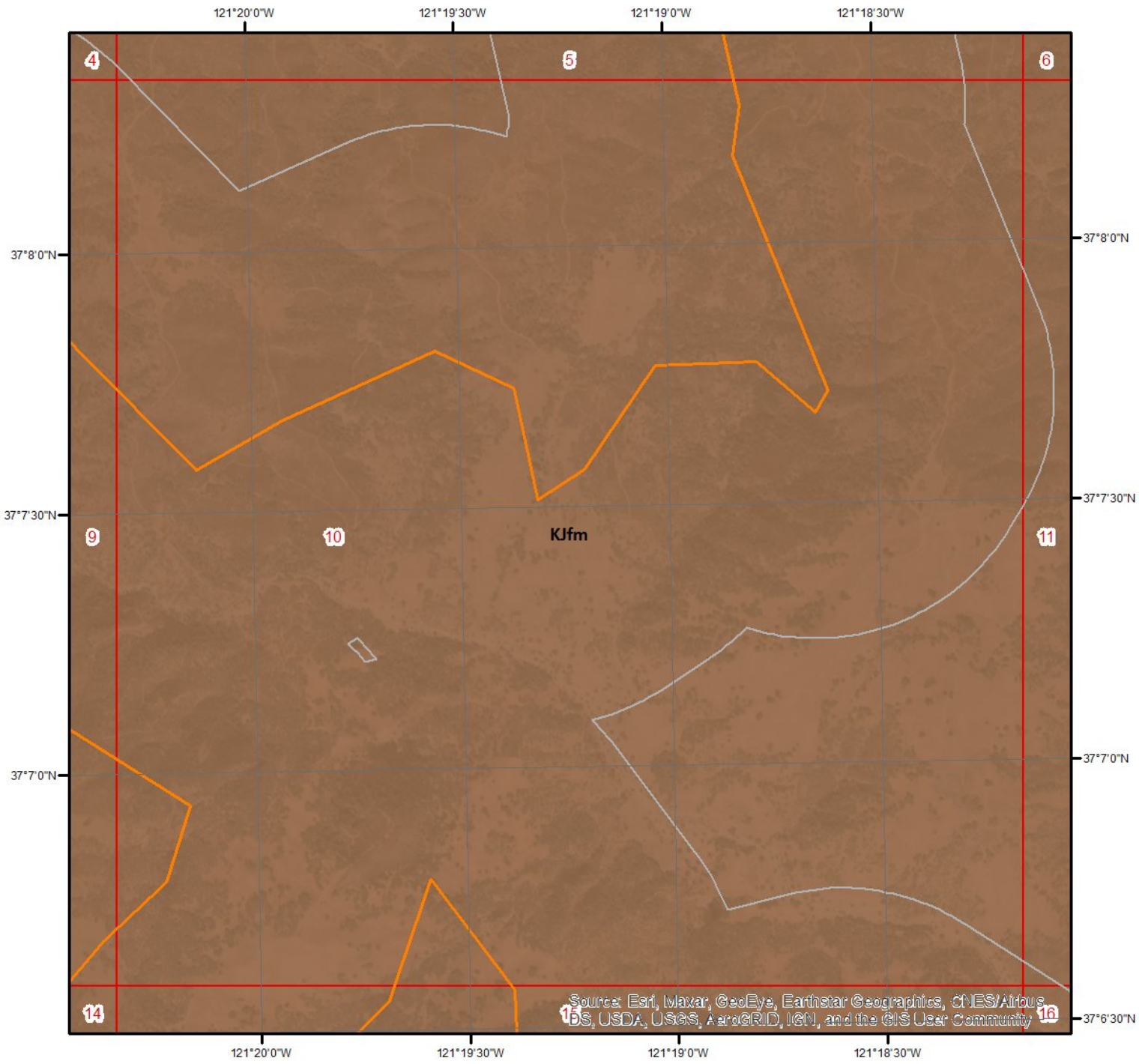
N

Geologic Units - Page 9

This maps shows geologic units in the area. Please refer to the report for detailed descriptions.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Geologic Information

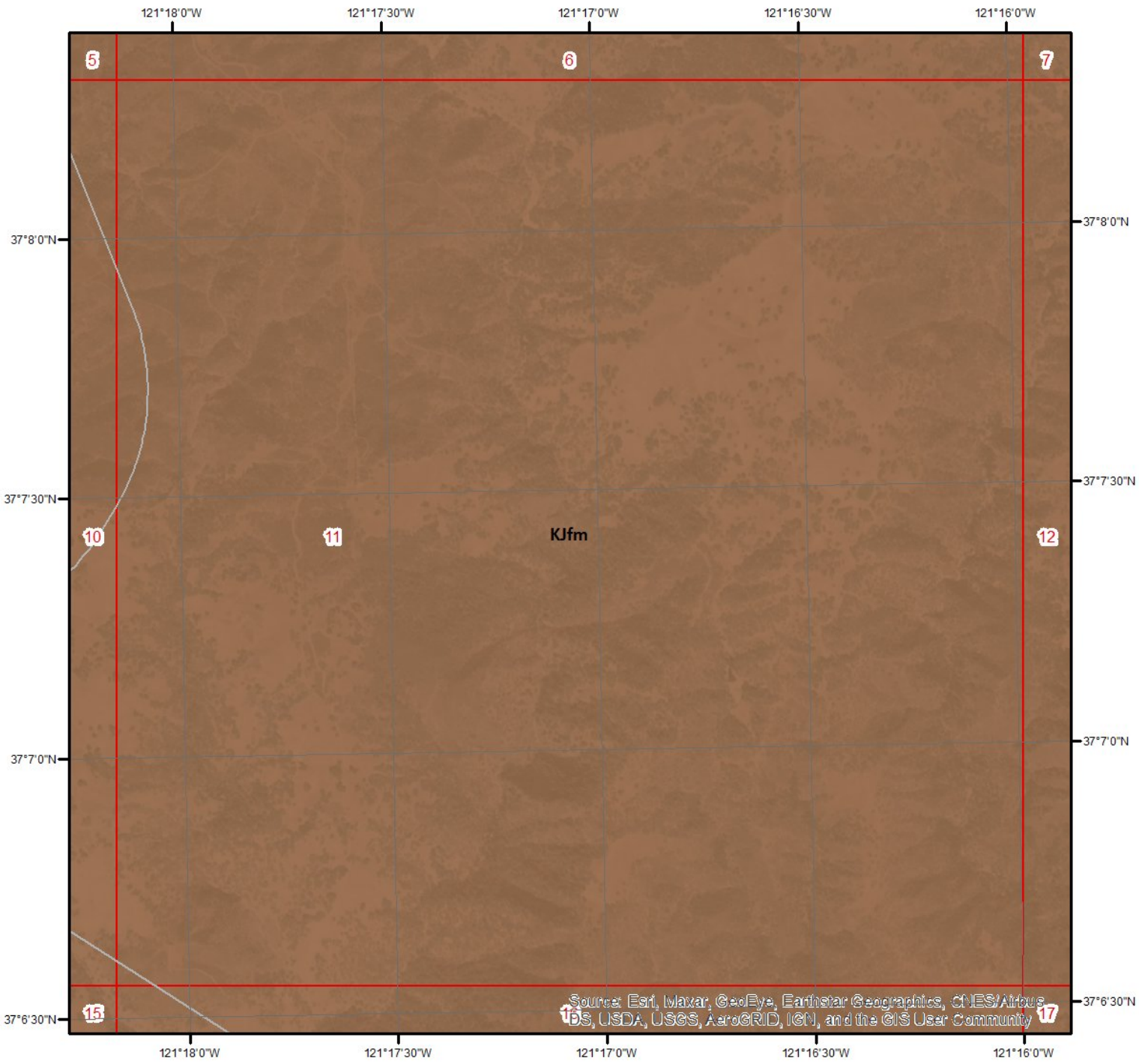


Geologic Units - Page 10

This maps shows geologic units in the area. Please refer to the report for detailed descriptions.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Geologic Information



Miles
0 0.2 0.4

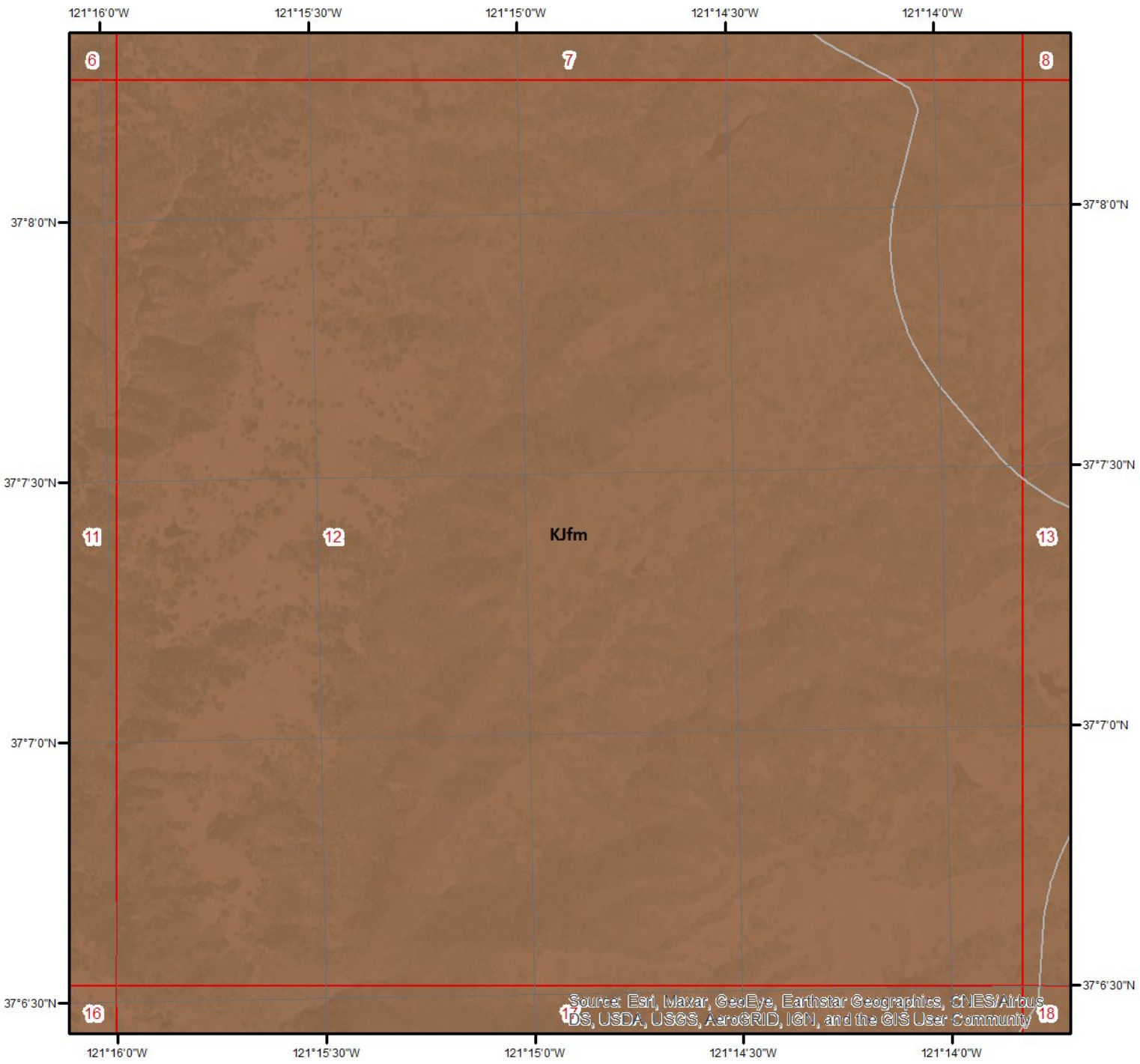
N

Geologic Units - Page 11

This maps shows geologic units in the area. Please refer to the report for detailed descriptions.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Geologic Information



Miles
0 0.2 0.4

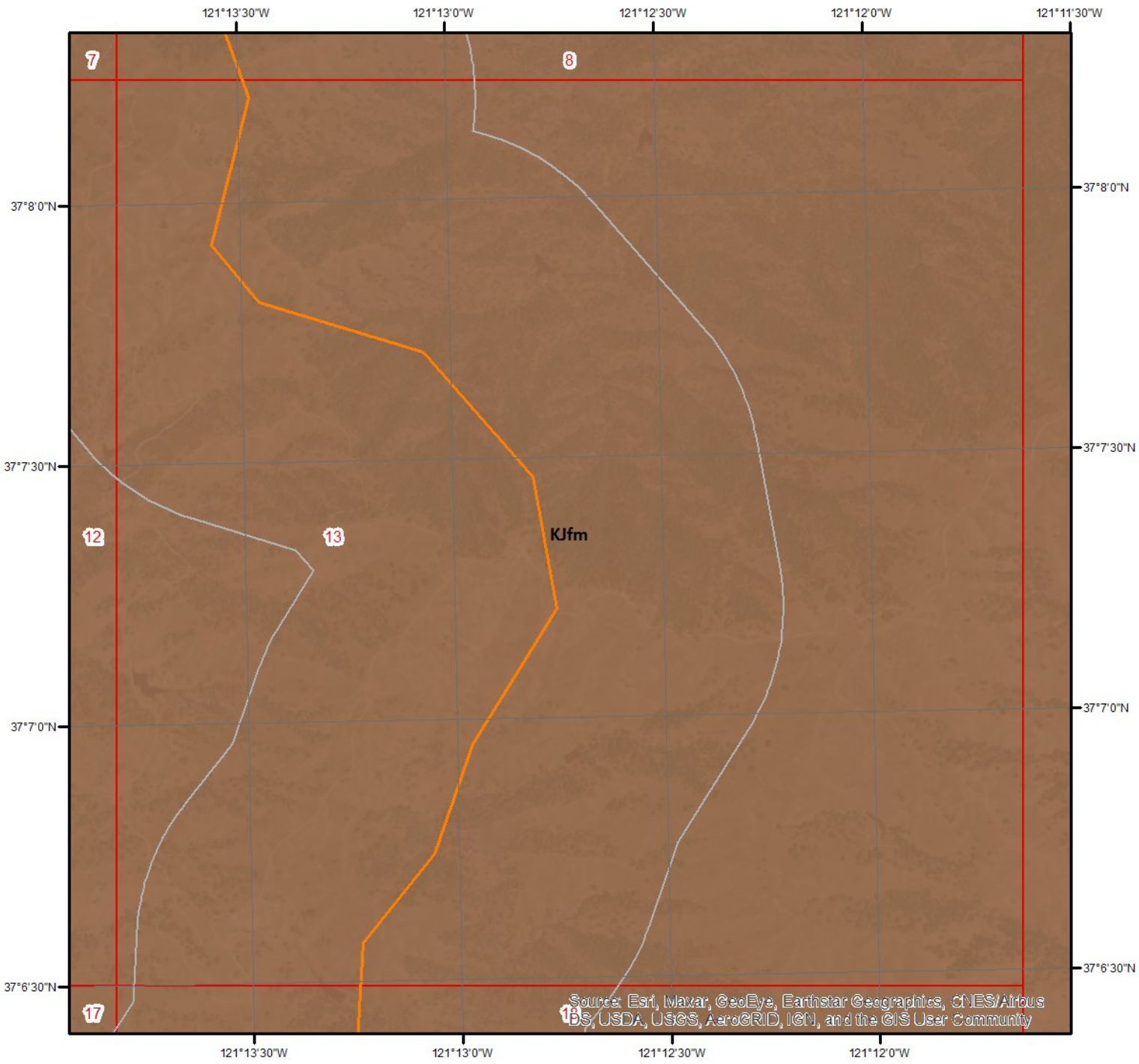
N

Geologic Units - Page 12

This maps shows geologic units in the area. Please refer to the report for detailed descriptions.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Geologic Information



Miles
0 0.2 0.4

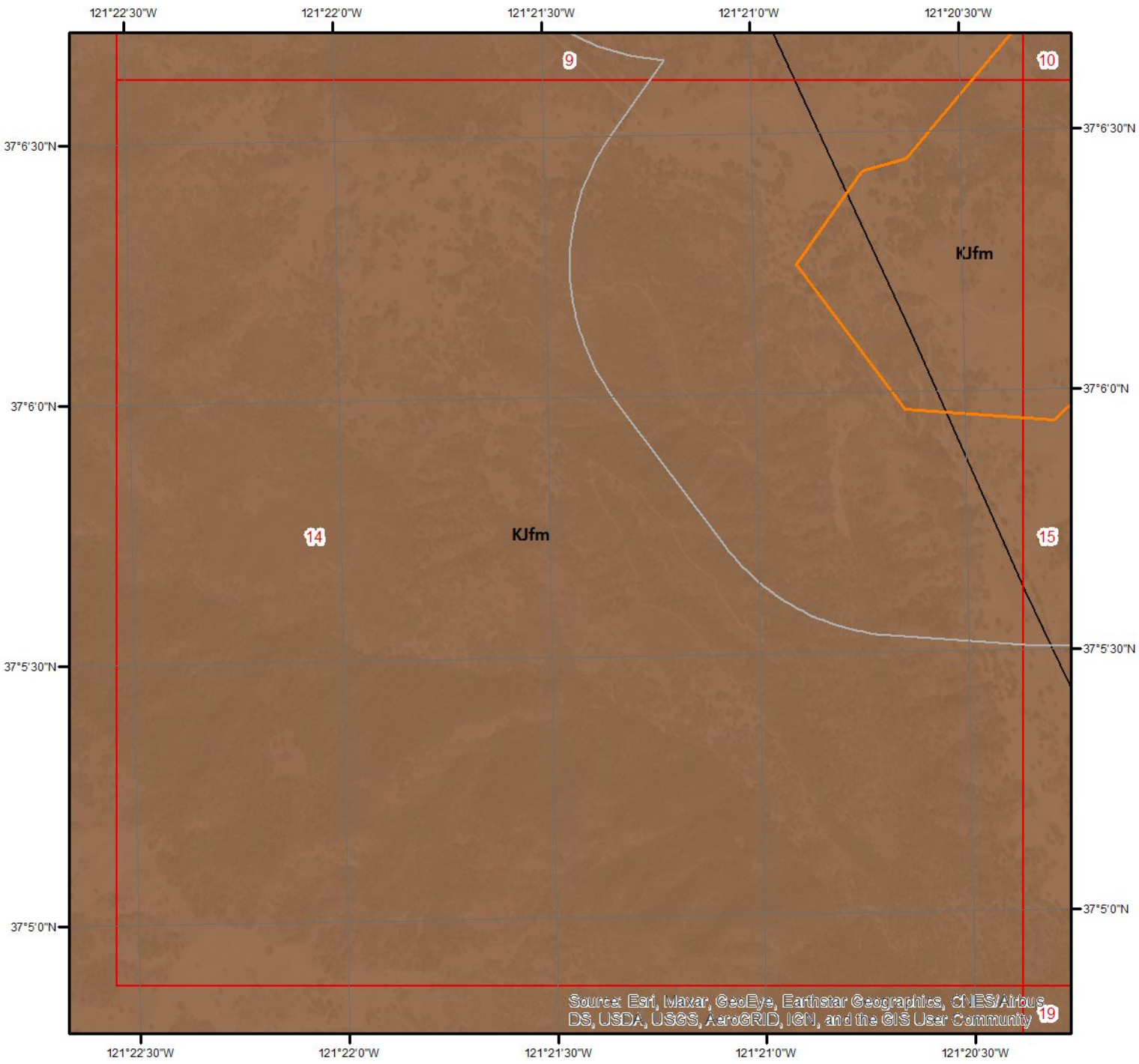
N

Geologic Units - Page 13

This maps shows geologic units in the area. Please refer to the report for detailed descriptions.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Geologic Information



Miles
0 0.2 0.4

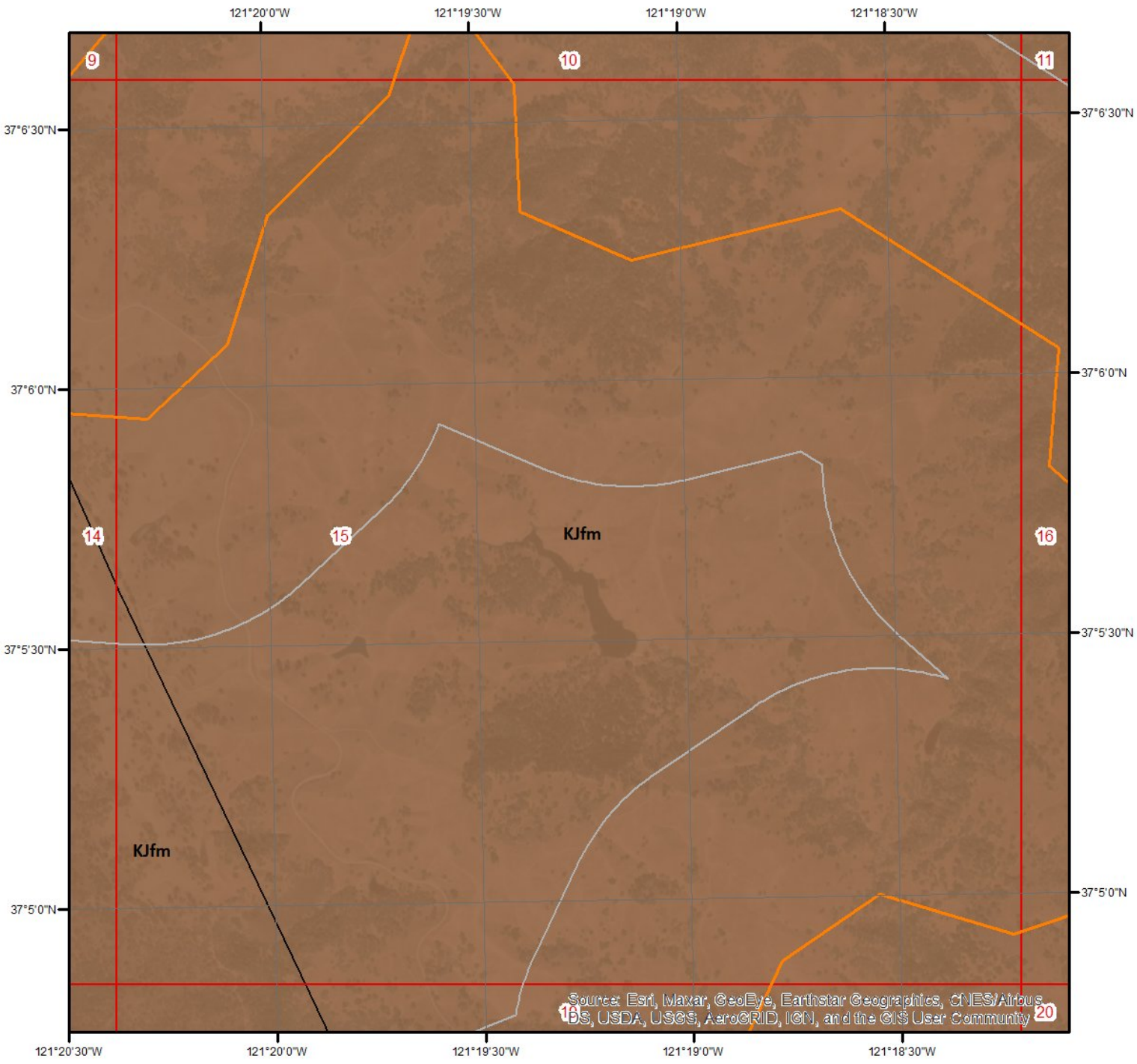
N

Geologic Units - Page 14

This maps shows geologic units in the area. Please refer to the report for detailed descriptions.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Geologic Information

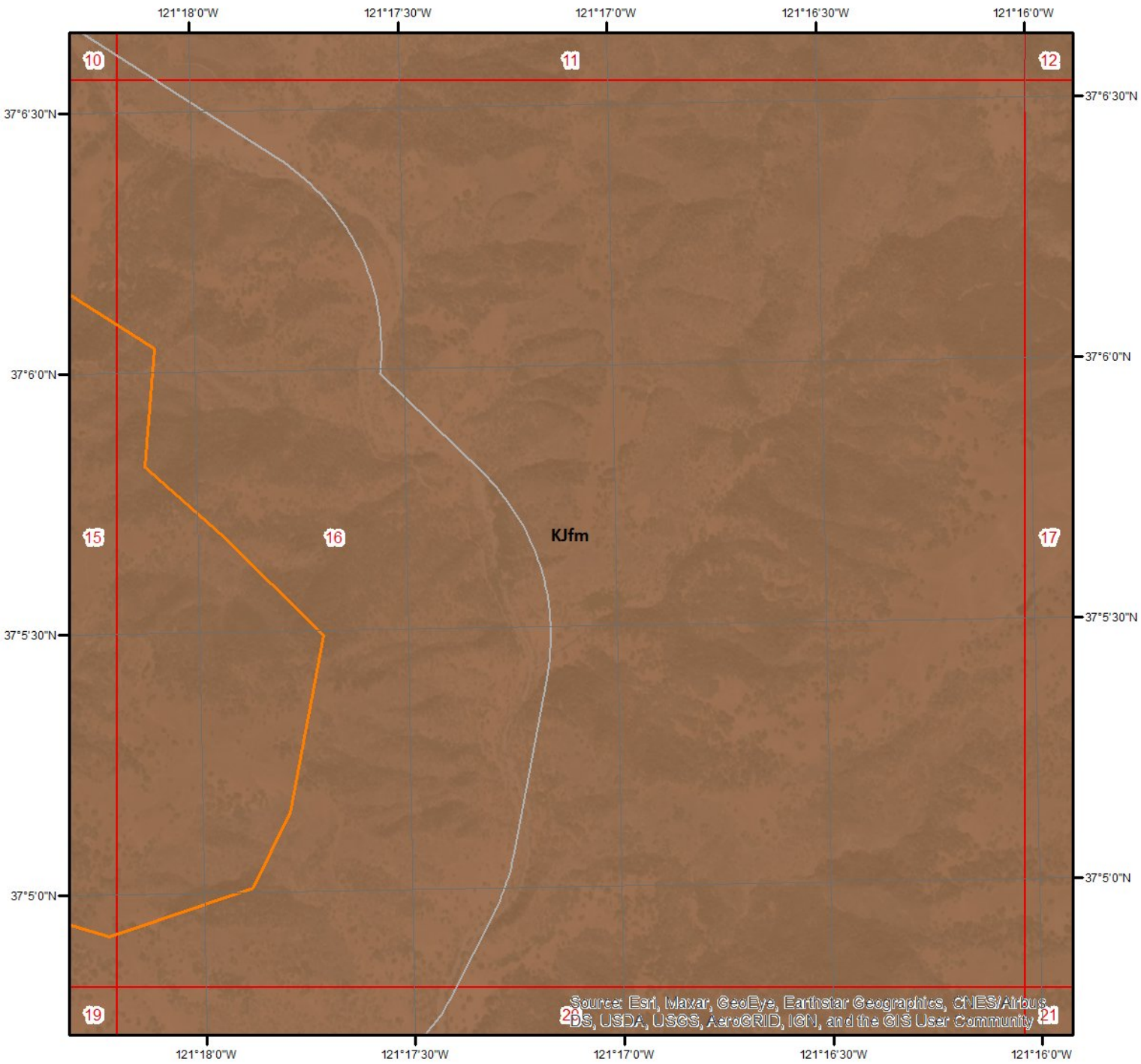


Geologic Units - Page 15

This maps shows geologic units in the area. Please refer to the report for detailed descriptions.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Geologic Information



0 0.2 0.4 Miles

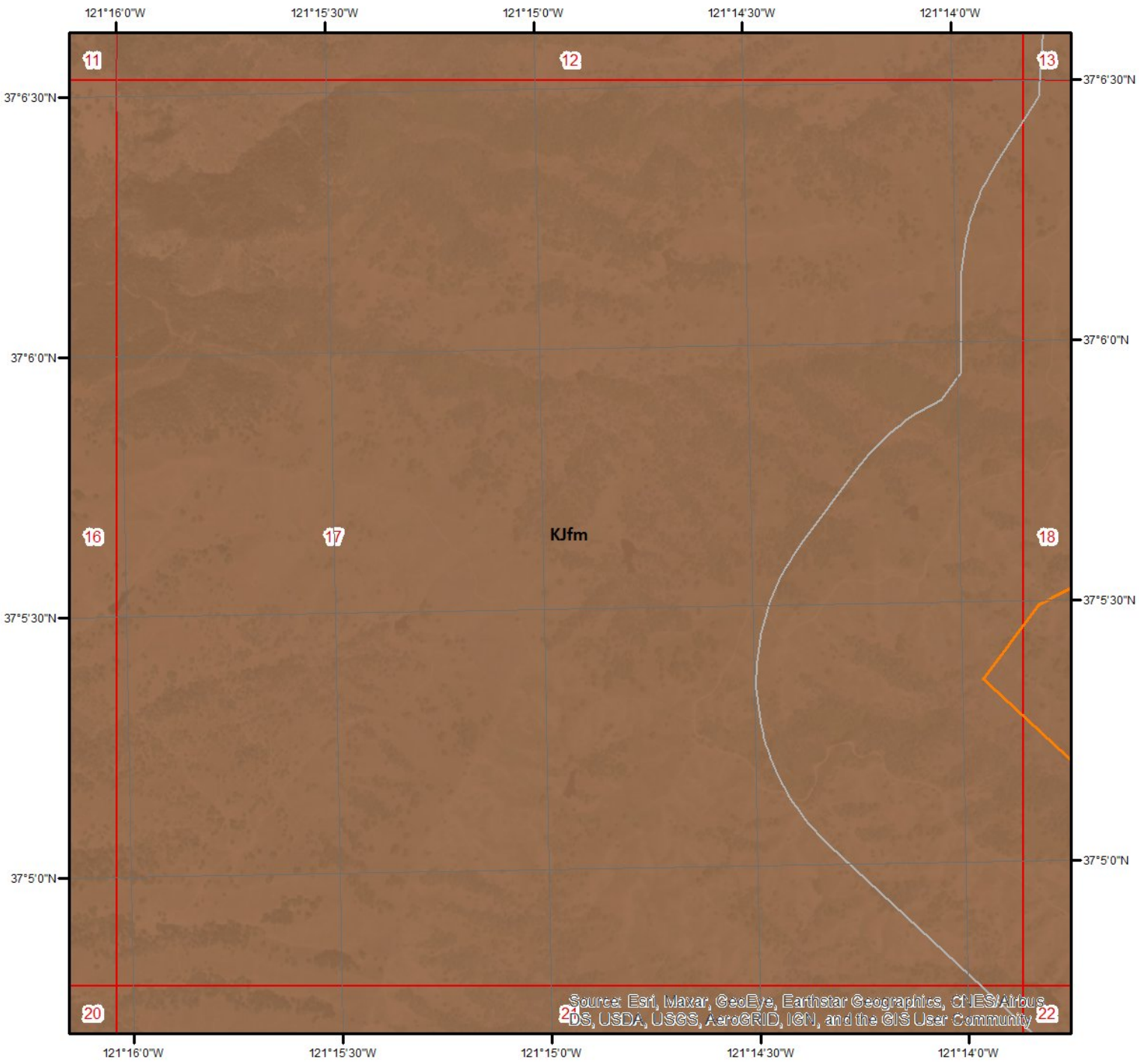
N

Geologic Units - Page 16

This maps shows geologic units in the area. Please refer to the report for detailed descriptions.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Geologic Information



Miles
0 0.2 0.4

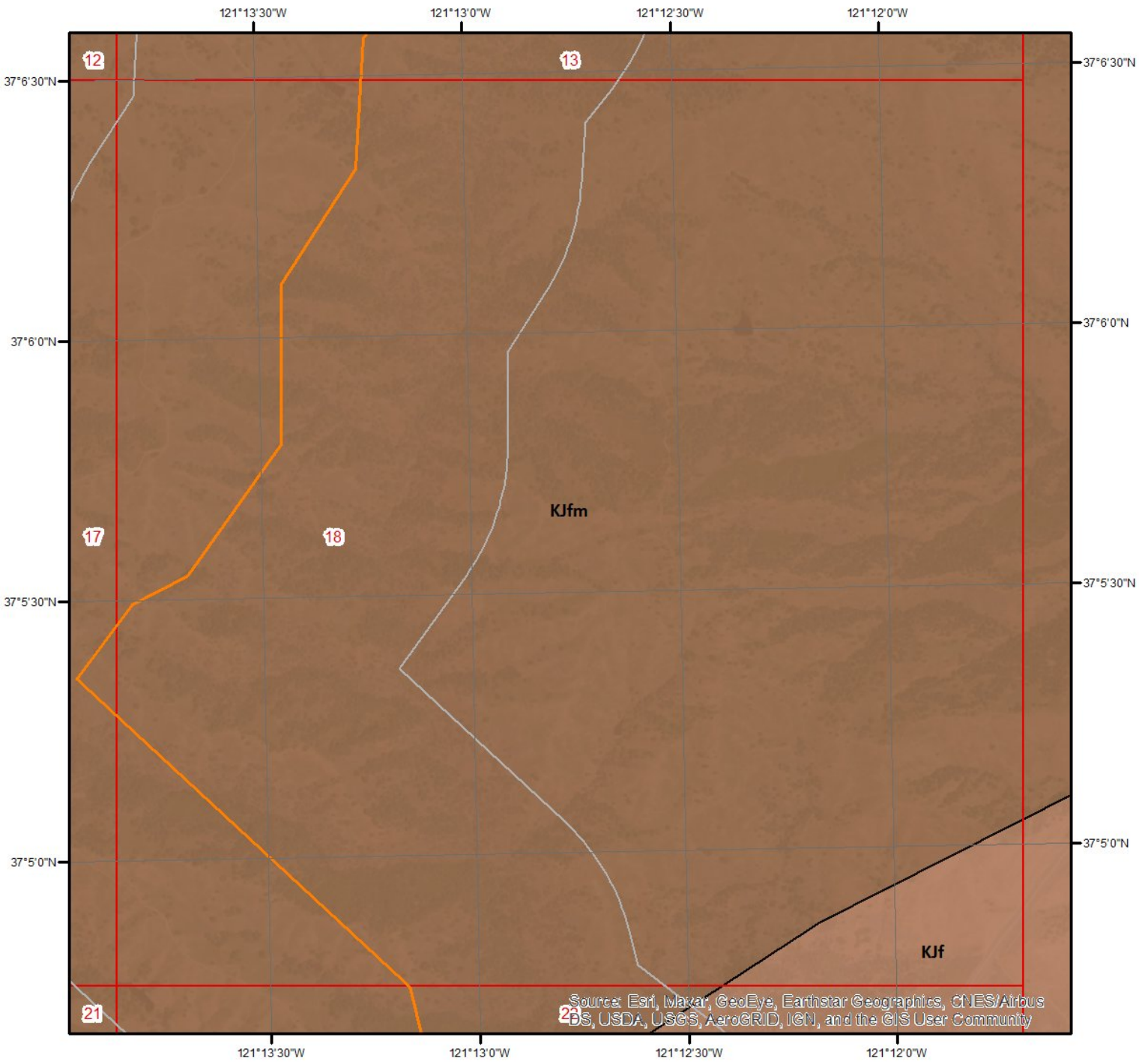
N

Geologic Units - Page 17

This maps shows geologic units in the area. Please refer to the report for detailed descriptions.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Geologic Information

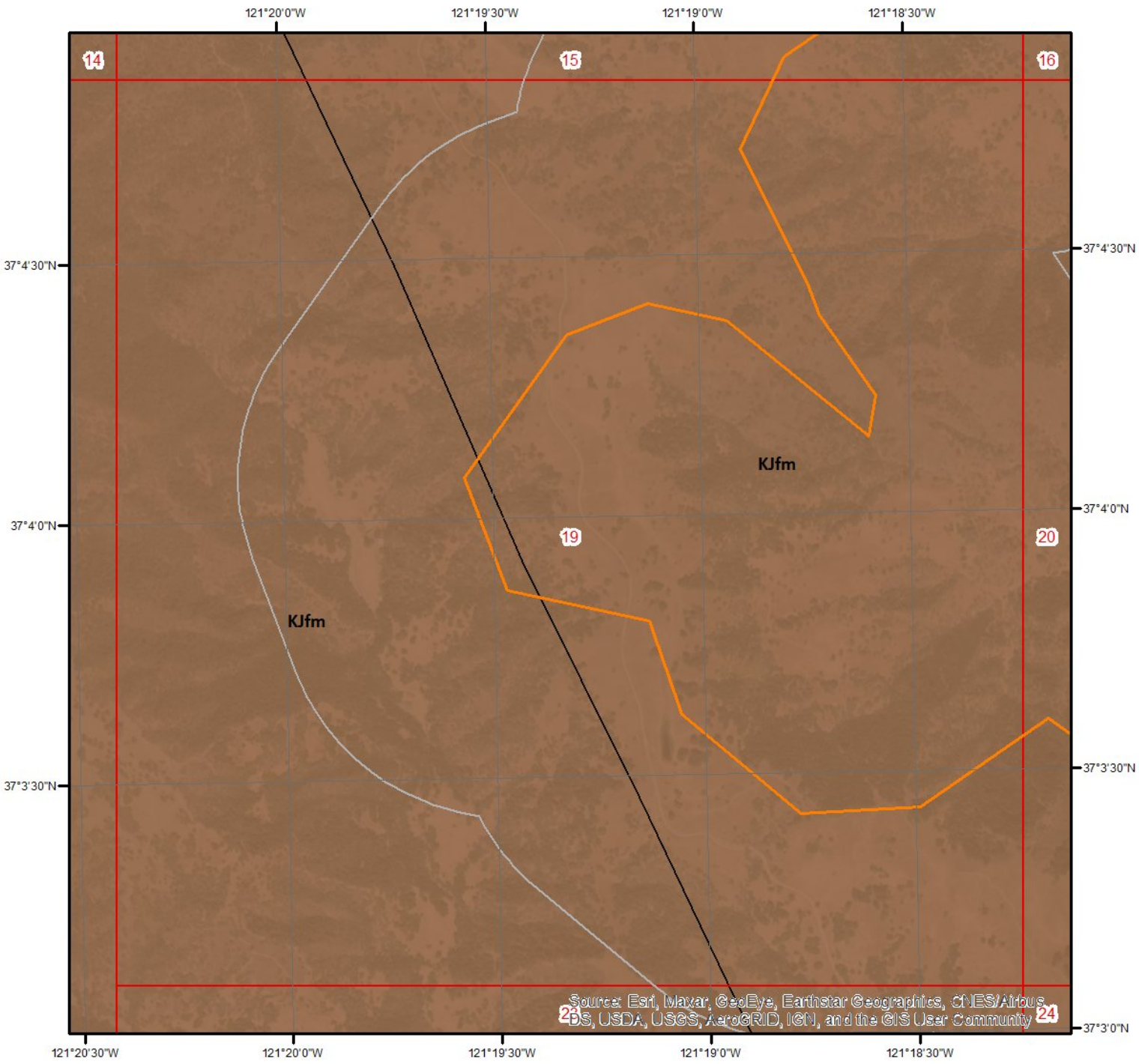


Geologic Units - Page 18

This maps shows geologic units in the area. Please refer to the report for detailed descriptions.

ENVIRONMENTAL RISK INFORMATION SERVICES

Geologic Information



Miles
0 0.2 0.4

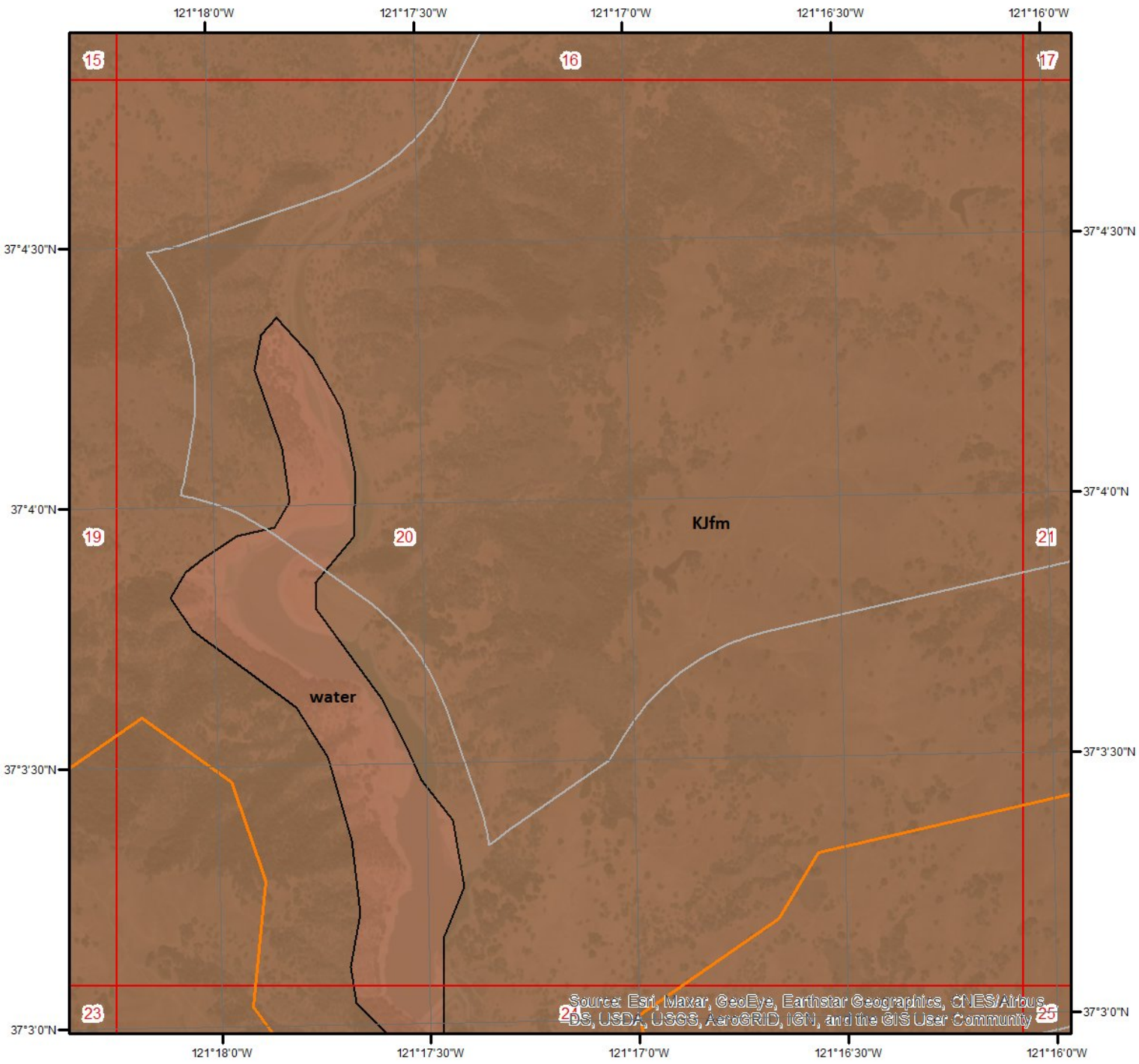
N

Geologic Units - Page 19

This maps shows geologic units in the area. Please refer to the report for detailed descriptions.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Geologic Information



Miles

0 0.2 0.4

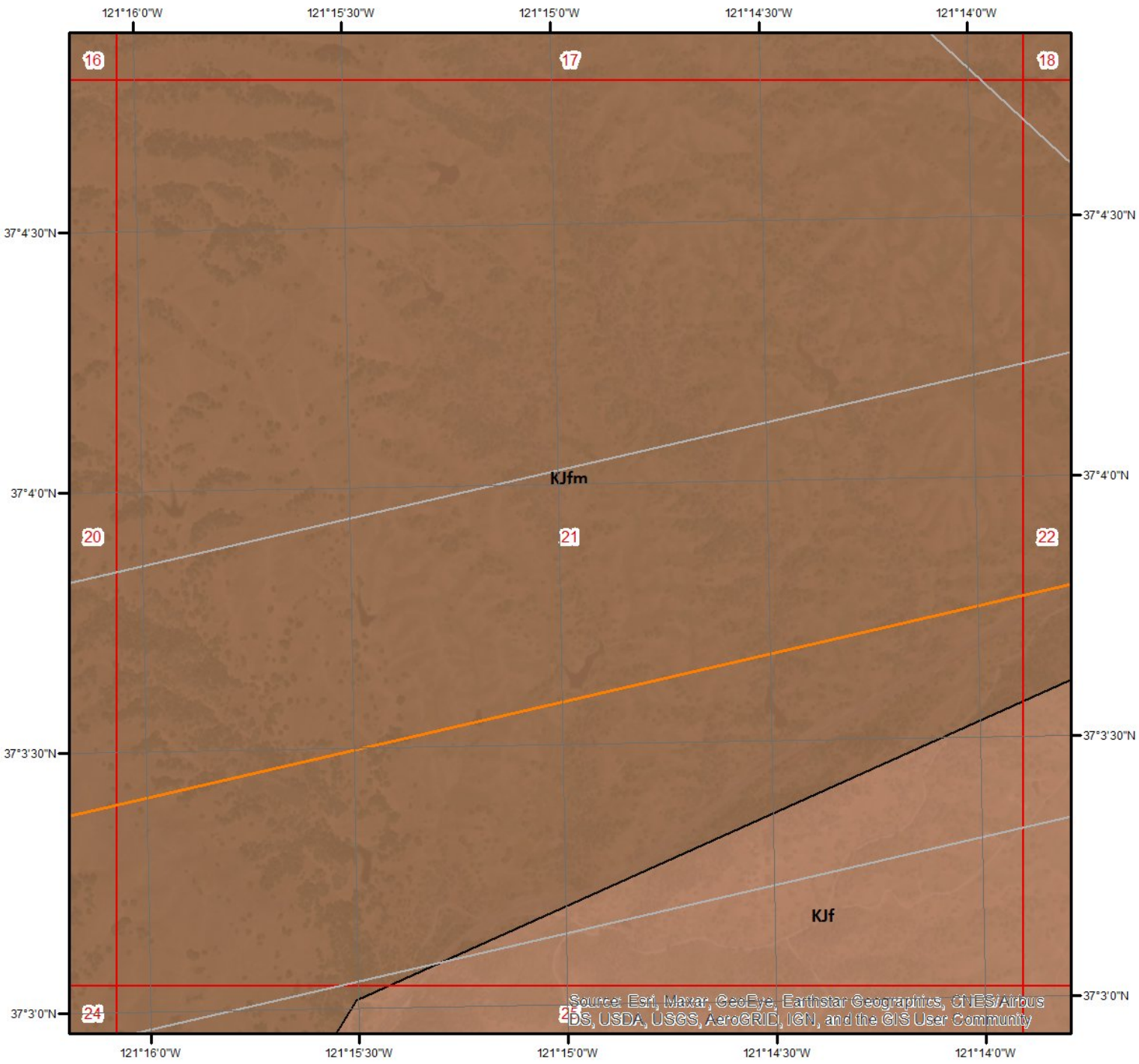
N

Geologic Units - Page 20

This maps shows geologic units in the area. Please refer to the report for detailed descriptions.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Geologic Information



Miles
0 0.2 0.4

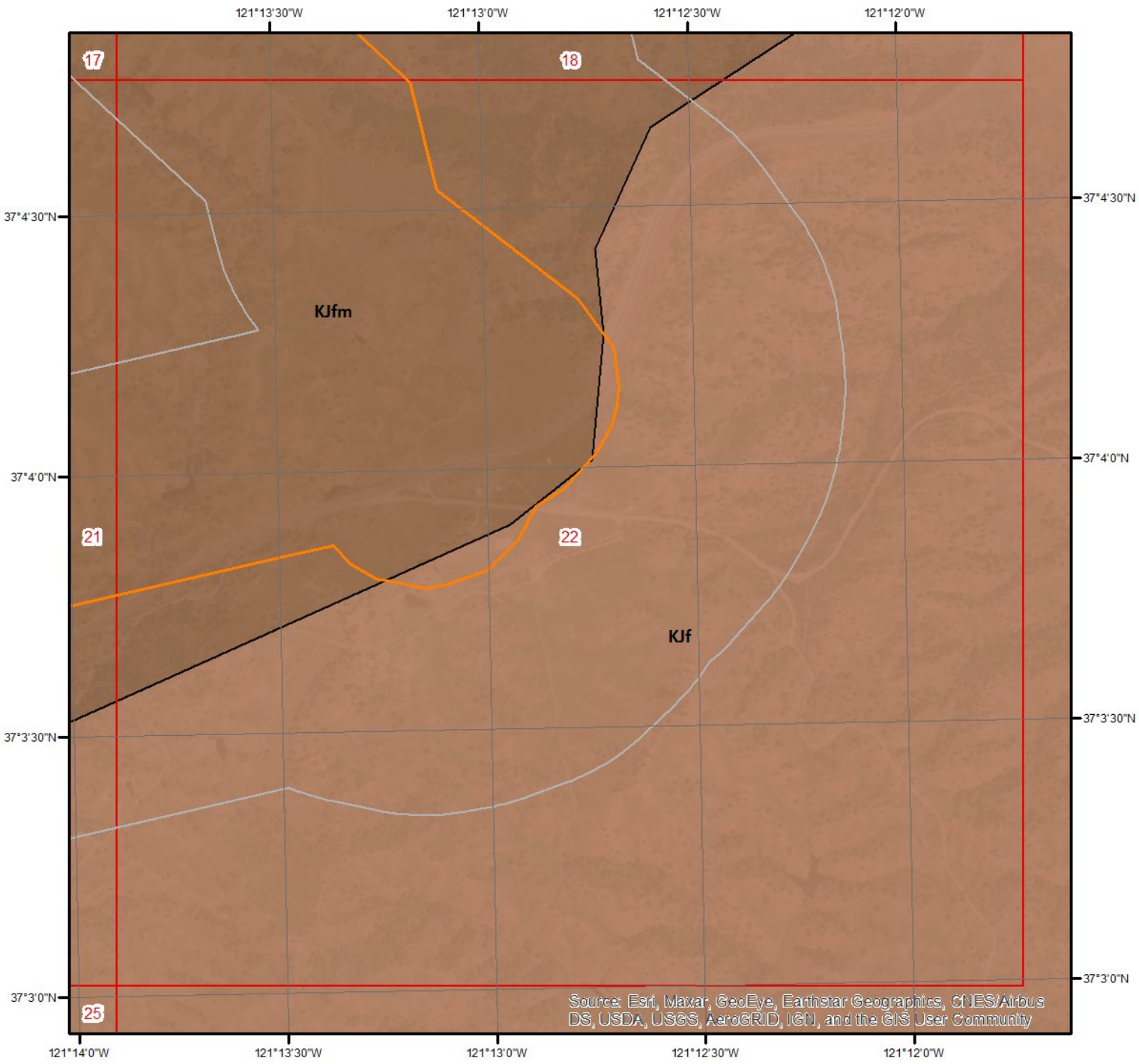
N

Geologic Units - Page 21

This maps shows geologic units in the area. Please refer to the report for detailed descriptions.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Geologic Information



0 0.2 0.4 Miles

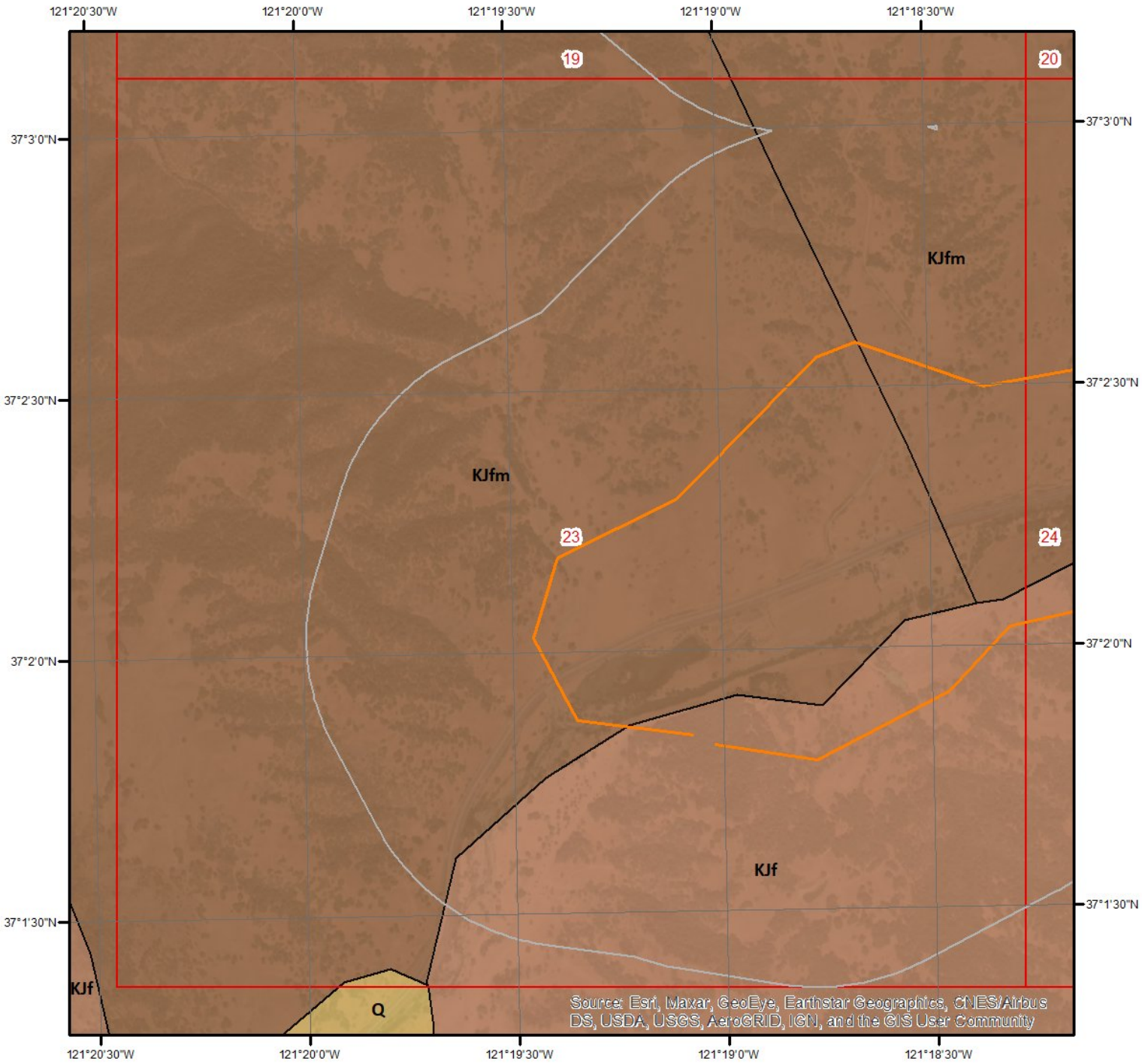
N

Geologic Units - Page 22

This maps shows geologic units in the area. Please refer to the report for detailed descriptions.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Geologic Information



Miles
0 0.2 0.4

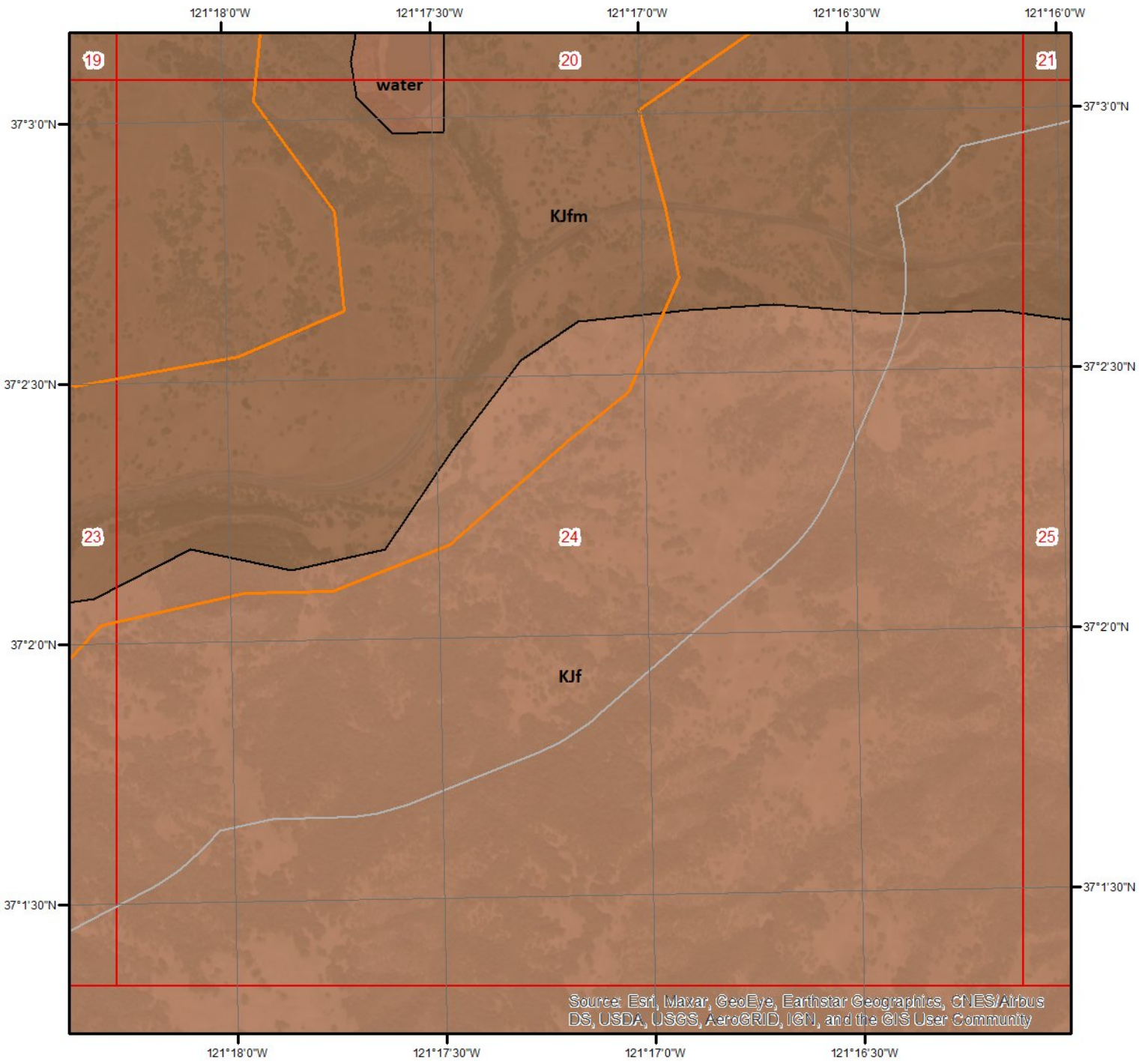
N

Geologic Units - Page 23

This maps shows geologic units in the area. Please refer to the report for detailed descriptions.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Geologic Information



Miles
0 0.2 0.4

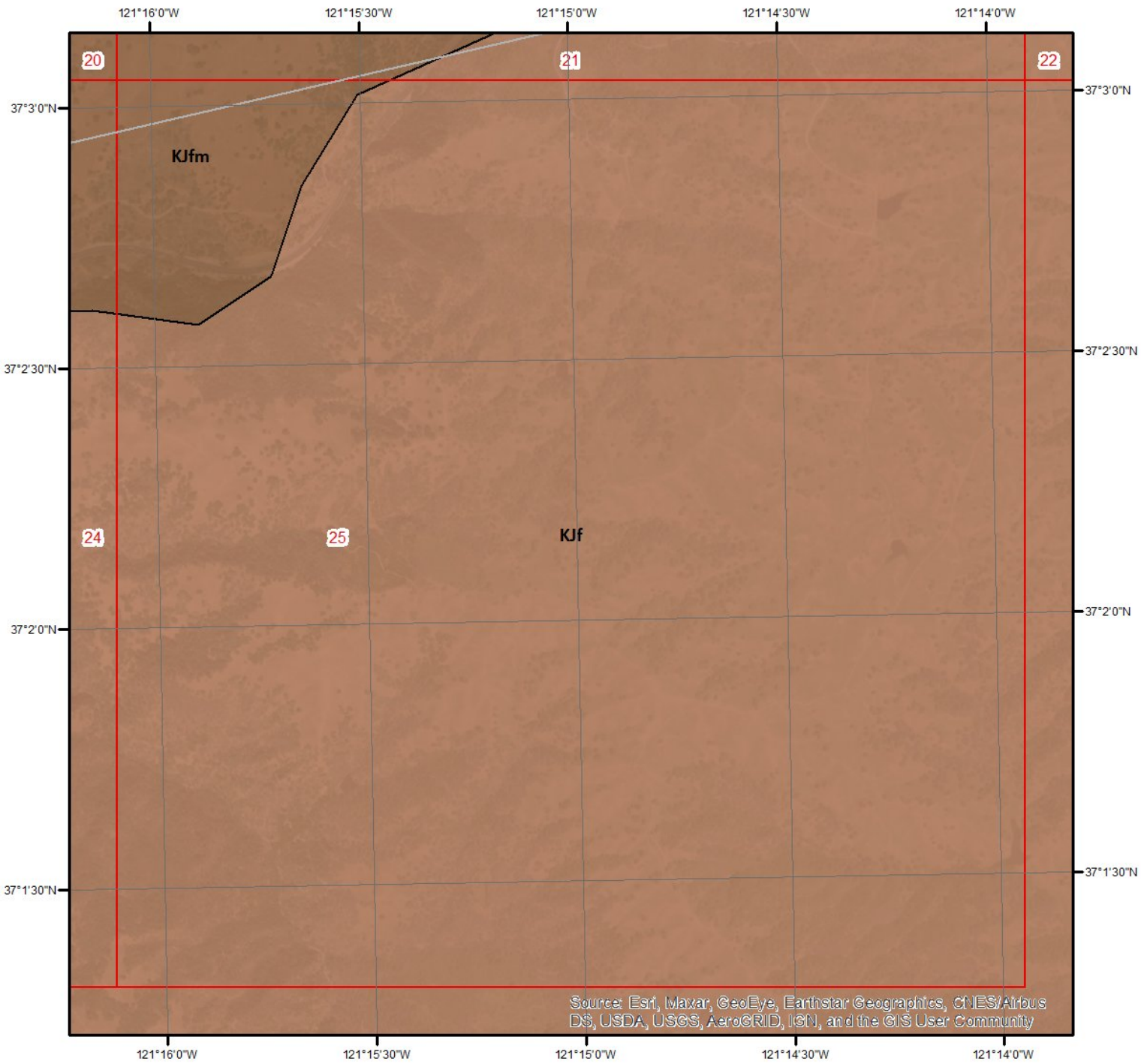
N

Geologic Units - Page 24

This maps shows geologic units in the area. Please refer to the report for detailed descriptions.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Geologic Information



Miles
0 0.2 0.4

N

Geologic Units - Page 25

This maps shows geologic units in the area. Please refer to the report for detailed descriptions.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Geologic Information

The previous page shows USGS geology information. Detailed information about each unit is provided below.

Geologic Unit KJfm

Unit Name:	Franciscan melange
Unit Age:	Jurassic to Cretaceous
Primary Rock Type:	melange
Secondary Rock Type:	
Unit Description:	Melange of fragmented and sheared Franciscan complex rocks.

Geologic Unit KJfm

Unit Name:	Franciscan melange
Unit Age:	Jurassic to Cretaceous
Primary Rock Type:	melange
Secondary Rock Type:	
Unit Description:	Melange of fragmented and sheared Franciscan complex rocks.

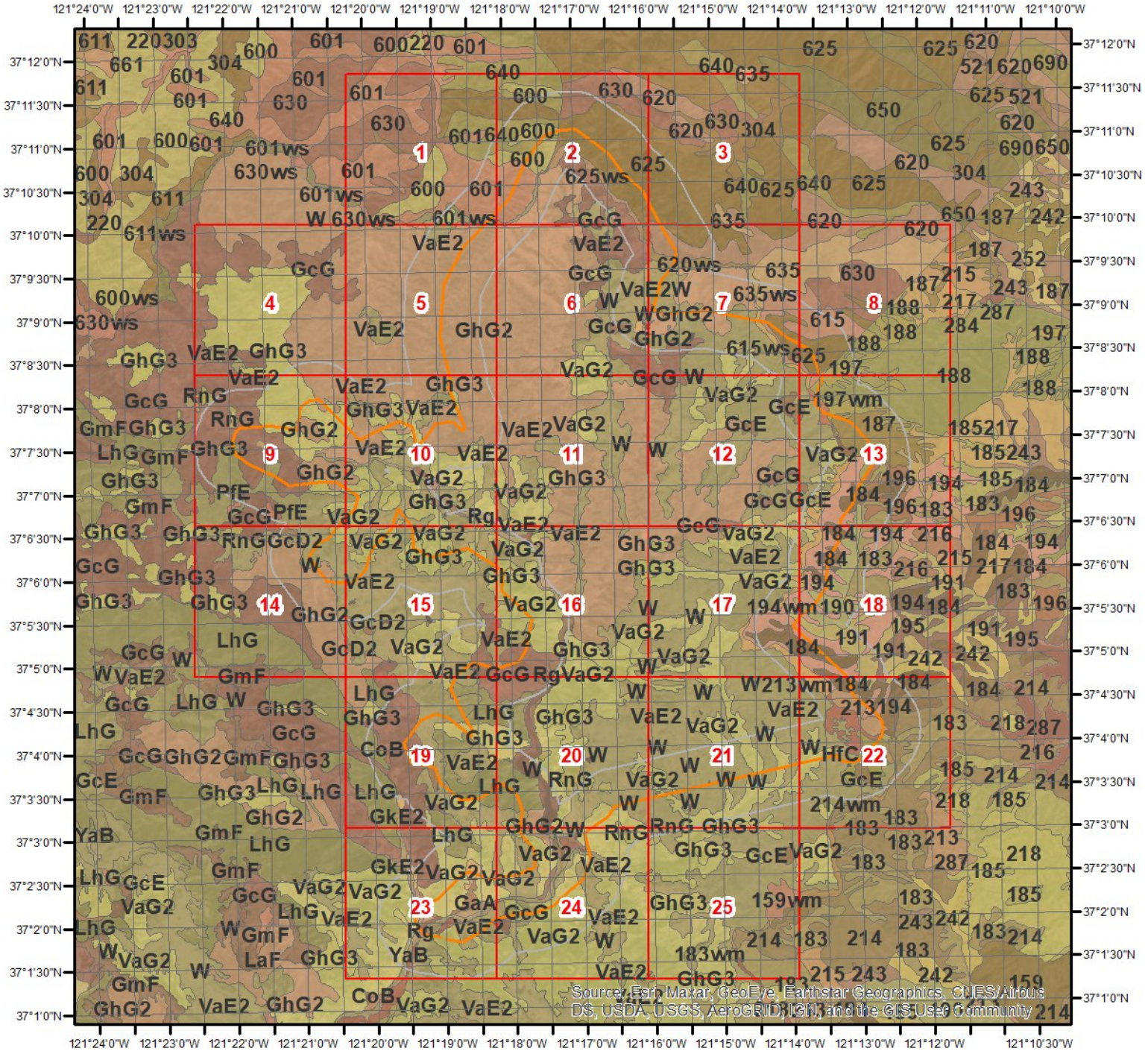
Geologic Unit KJf

Unit Name:	Franciscan Complex, unit 1 (Coast Ranges)
Unit Age:	Jurassic to Cretaceous
Primary Rock Type:	sandstone
Secondary Rock Type:	mudstone
Unit Description:	Franciscan complex: Cretaceous and Jurassic sandstone with smaller amounts of shale, chert, limestone, and conglomerate. Includes Franciscan melange, except where separated--see KJfm.

Geologic Unit water

Unit Name:	water
Unit Age:	Holocene
Primary Rock Type:	water
Secondary Rock Type:	
Unit Description:	water

Soil Information



SSURGO Soils

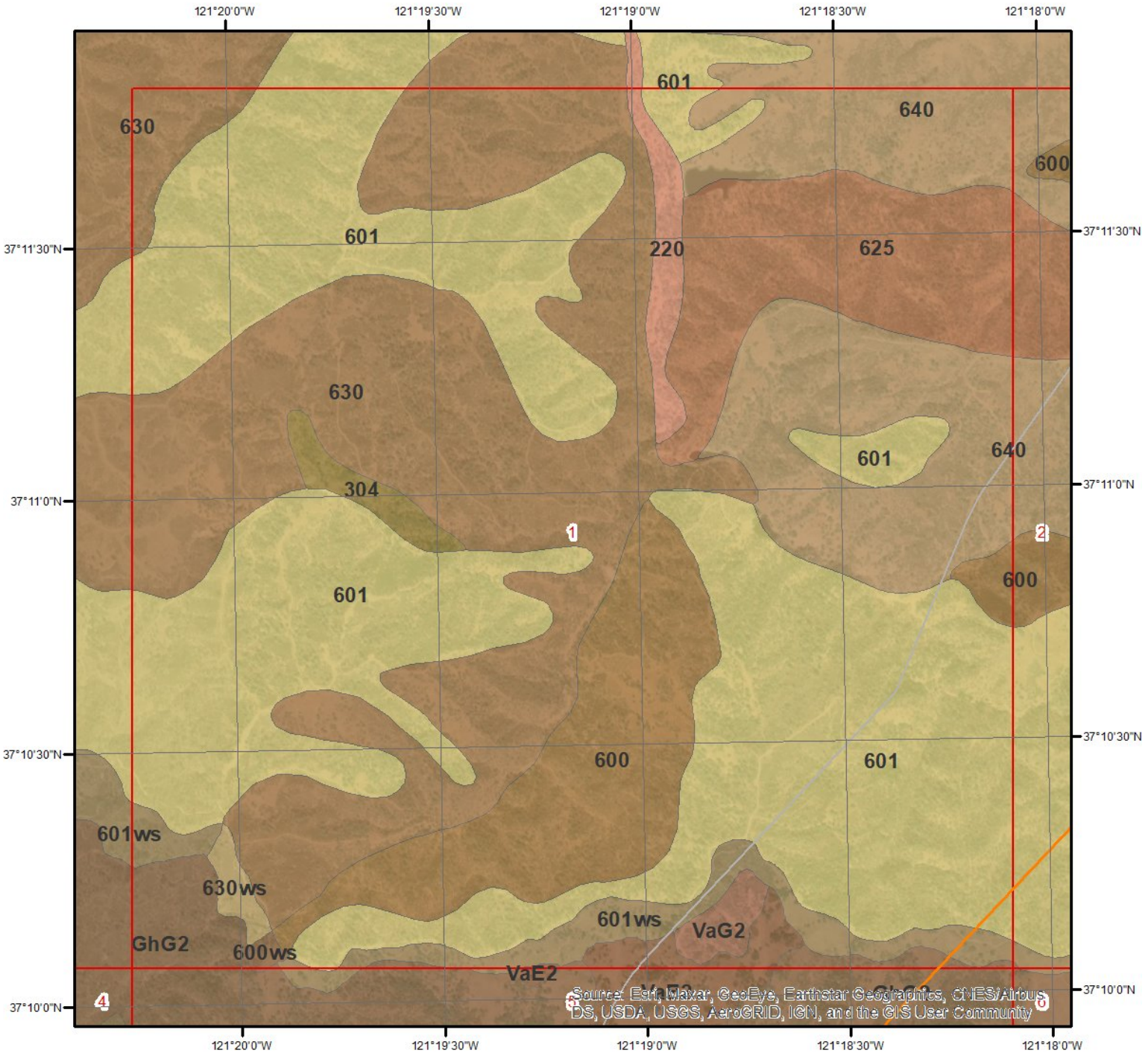
Miles
0 0.2 0.4 0.8 1.2 1.6 2 2.4

N

This maps shows SSURGO soil units around the target property. Please refer to the report for detailed soil descriptions.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Soil Information



SSURGO Soils - Page 1

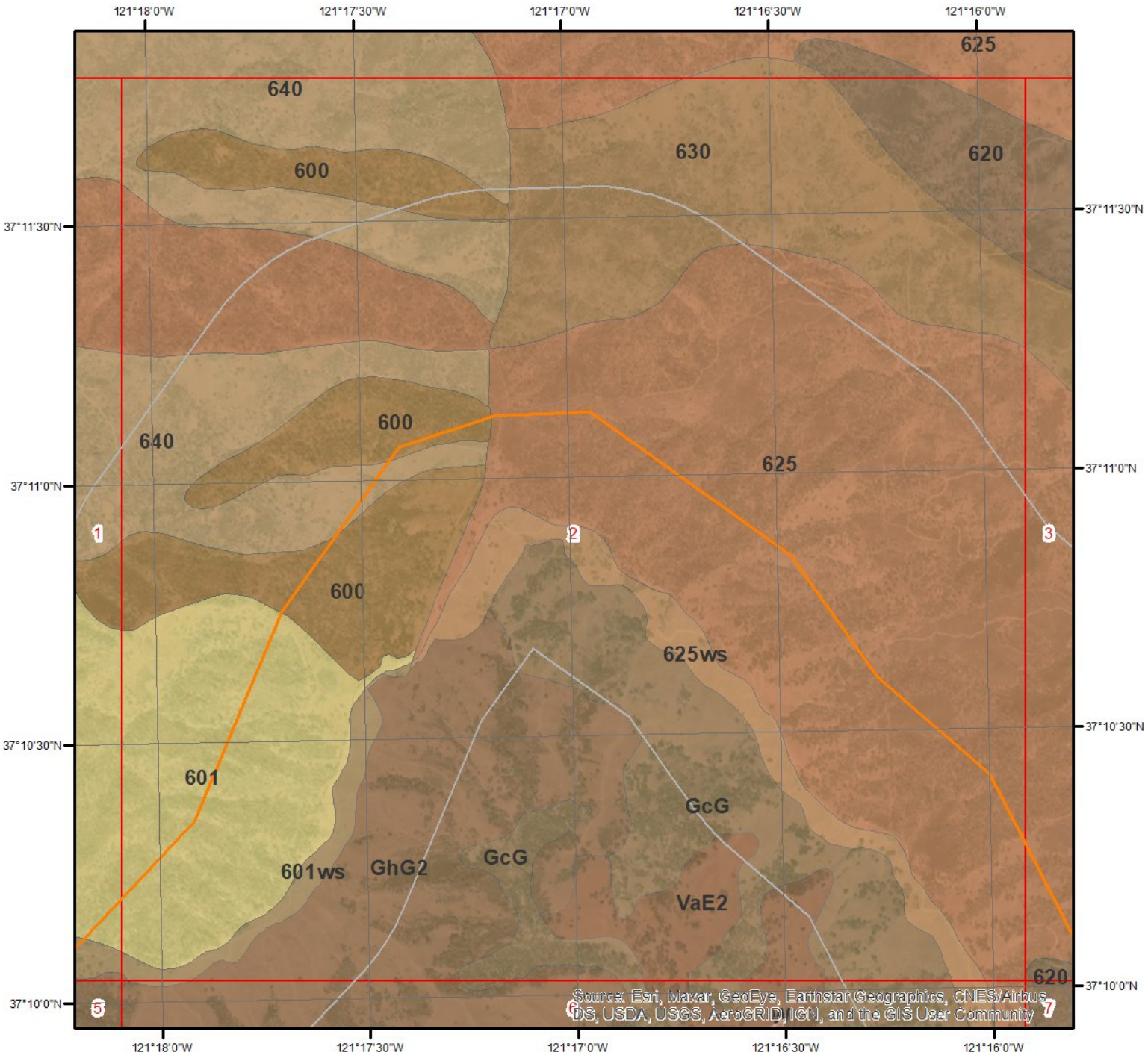
Miles
0 0.2 0.4

N

This maps shows SSURGO soil units around the target property. Please refer to the report for detailed soil descriptions.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Soil Information



SSURGO Soils - Page 2

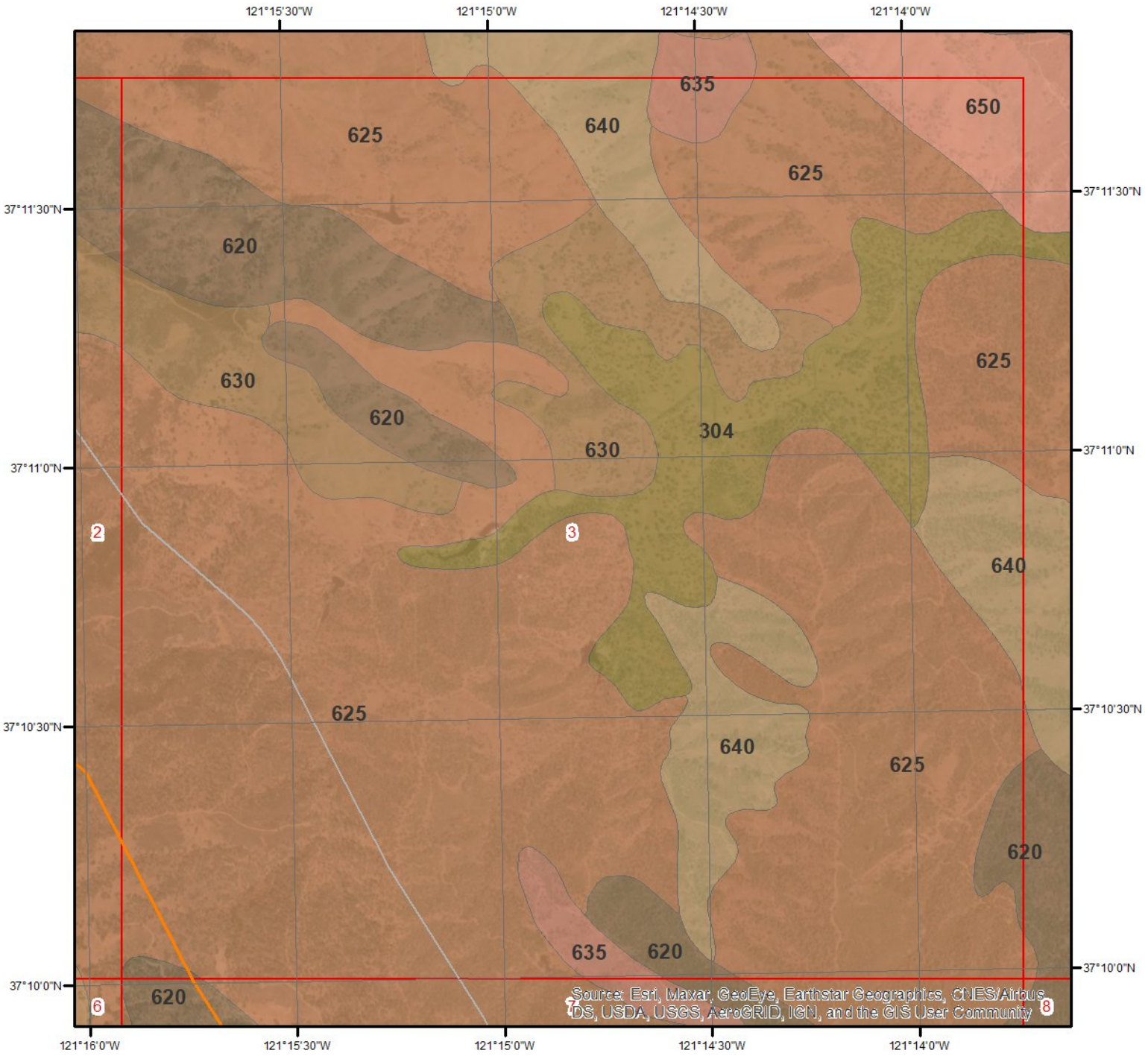
Miles
0 0.2 0.4

N

This maps shows SSURGO soil units around the target property. Please refer to the report for detailed soil descriptions.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Soil Information



SSURGO Soils - Page 3

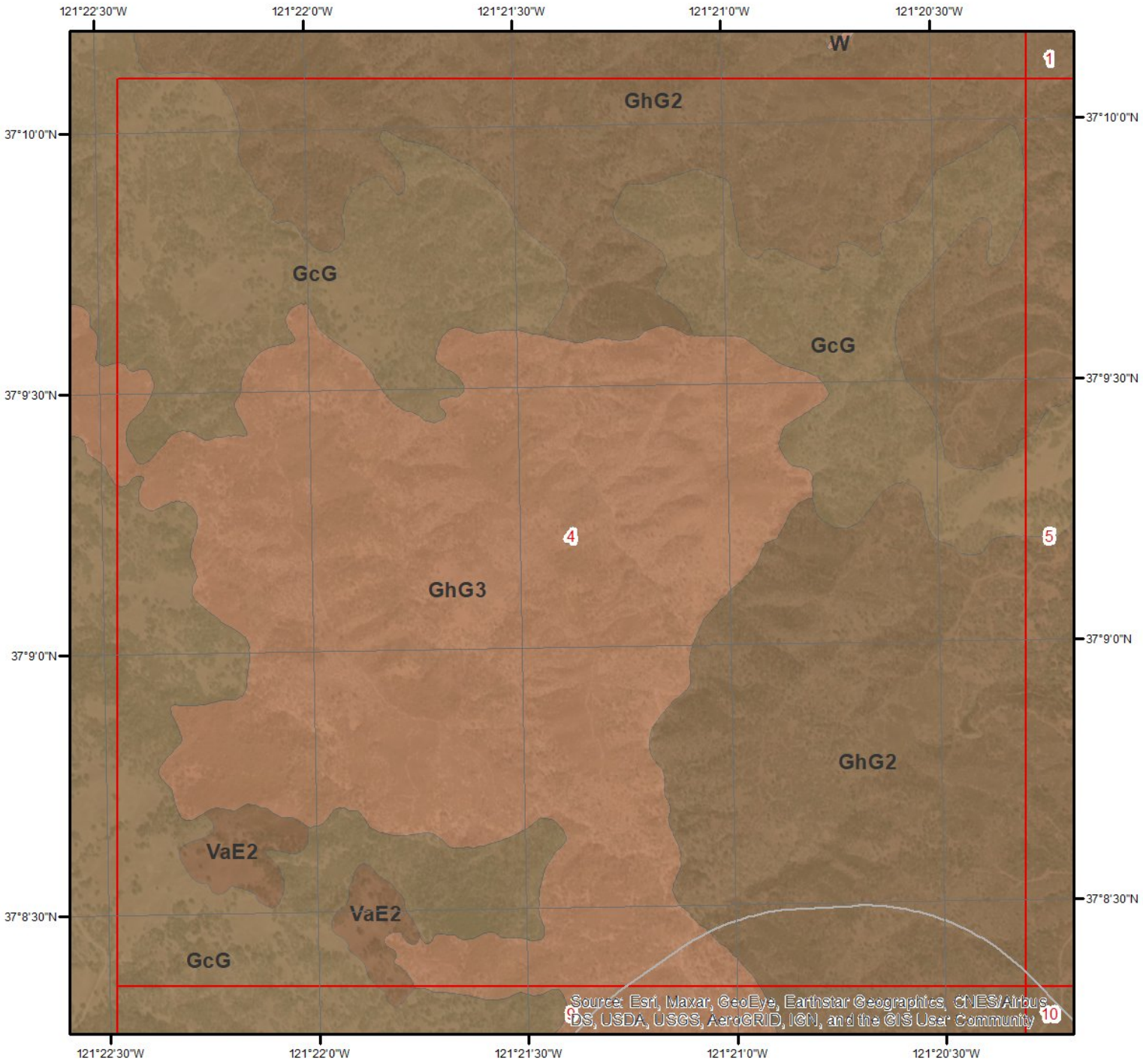
0 0.2 0.4 Miles

N

This maps shows SSURGO soil units around the target property. Please refer to the report for detailed soil descriptions.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Soil Information



SSURGO Soils - Page 4

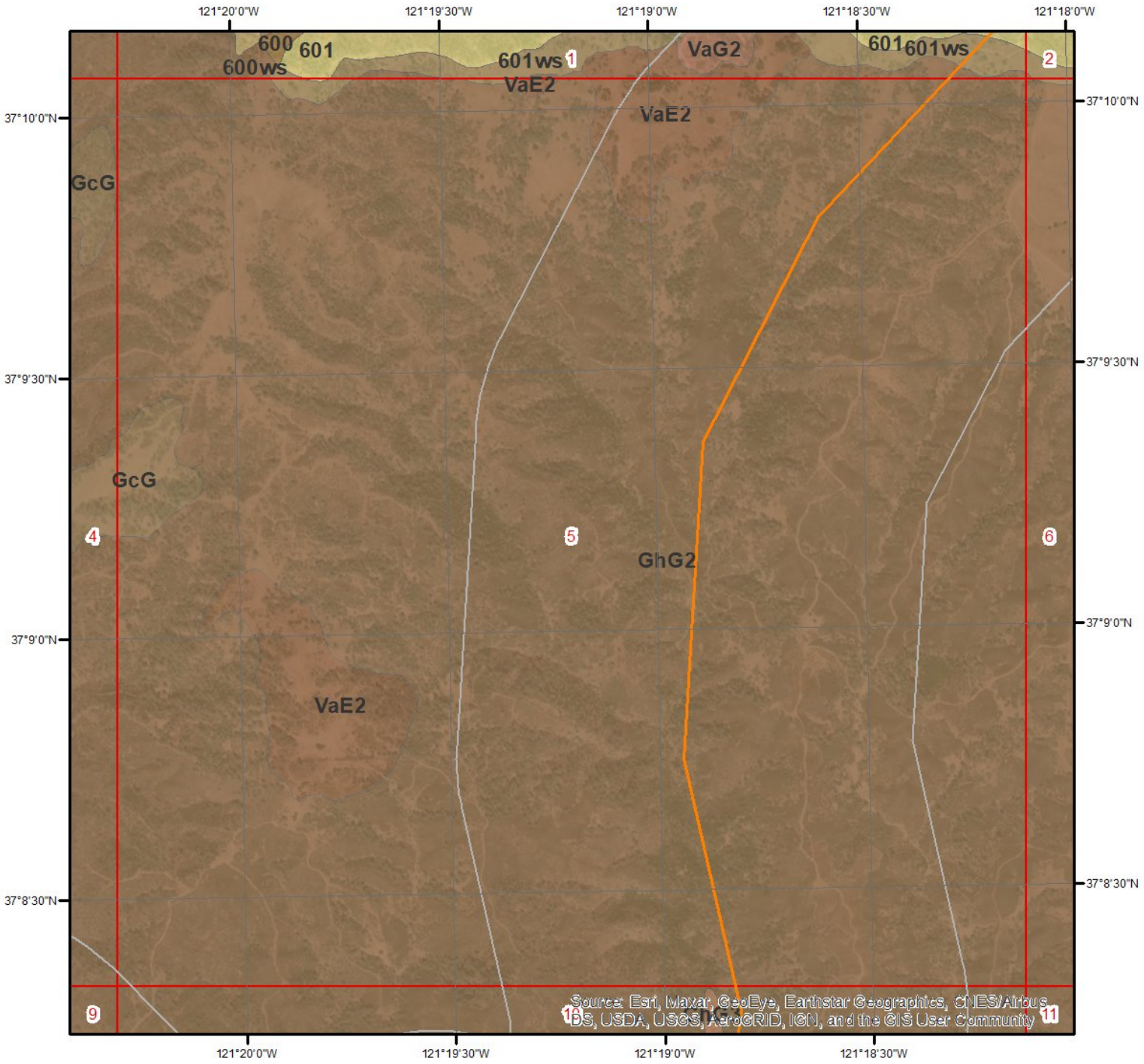
Miles
0 0.2 0.4

N

This maps shows SSURGO soil units around the target property. Please refer to the report for detailed soil descriptions.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Soil Information



SSURGO Soils - Page 5

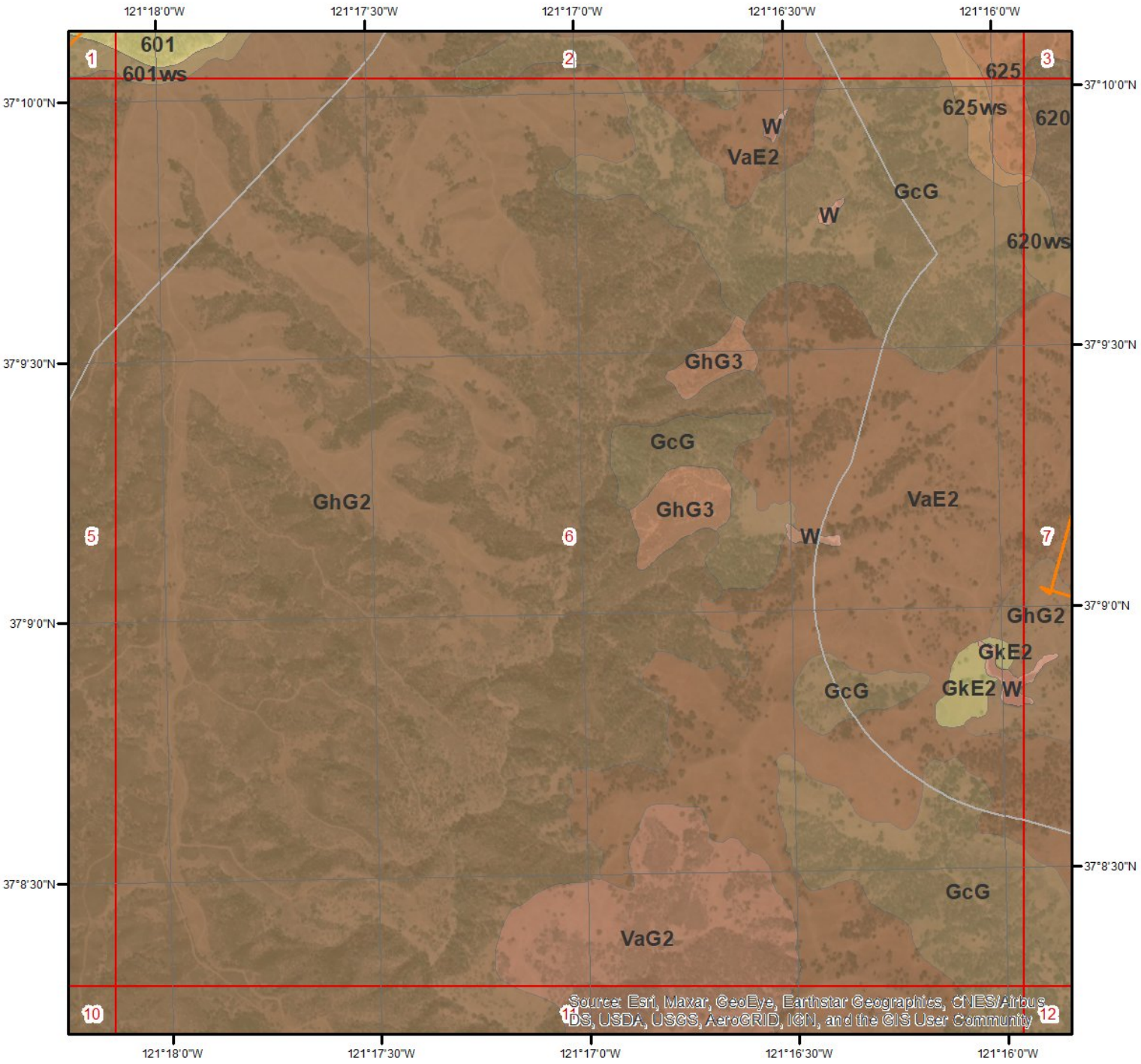
Miles
0 0.2 0.4

N

This maps shows SSURGO soil units around the target property. Please refer to the report for detailed soil descriptions.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Soil Information



SSURGO Soils - Page 6

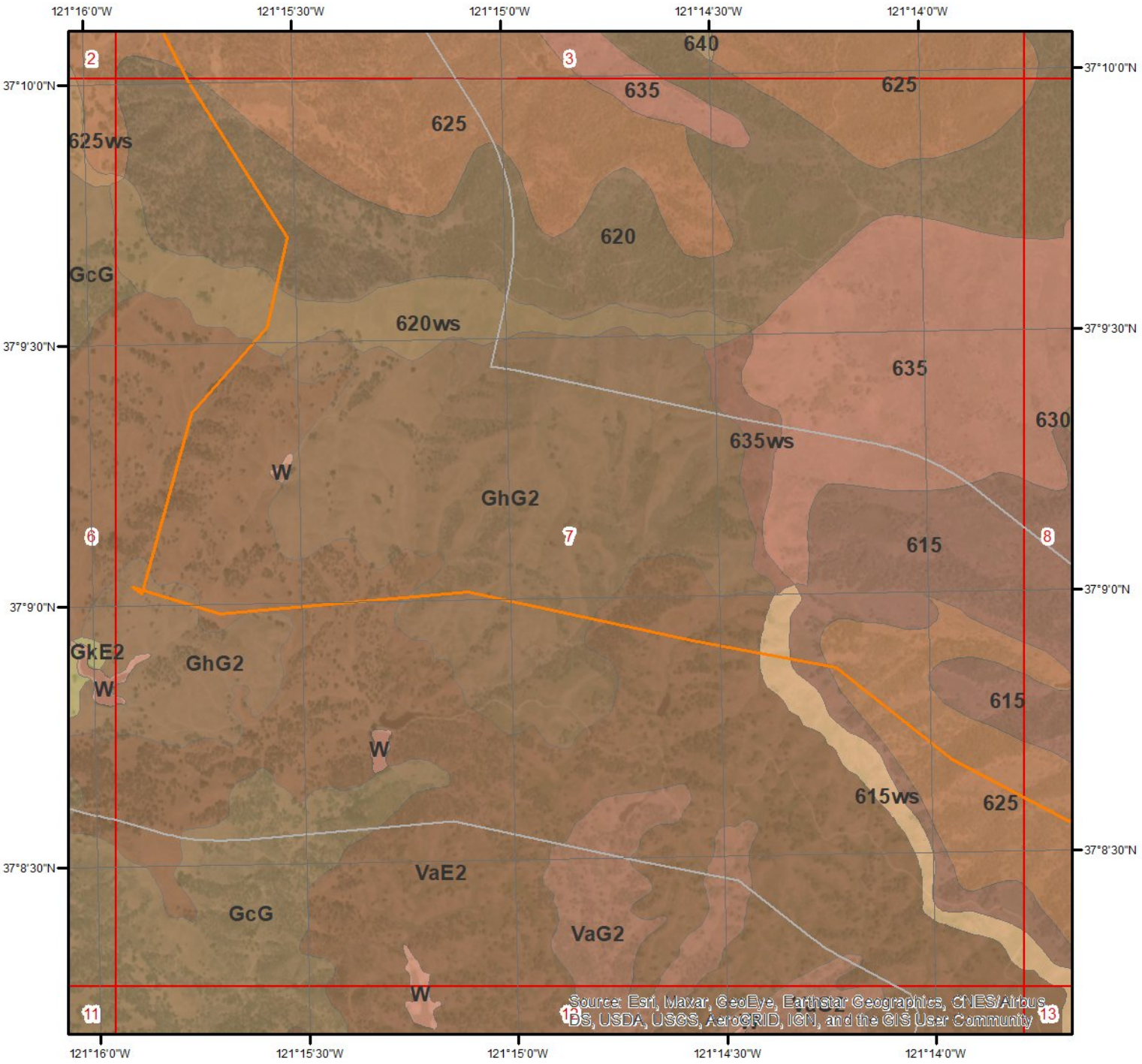
Miles
0 0.2 0.4

N

This maps shows SSURGO soil units around the target property. Please refer to the report for detailed soil descriptions.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Soil Information



SSURGO Soils - Page 7

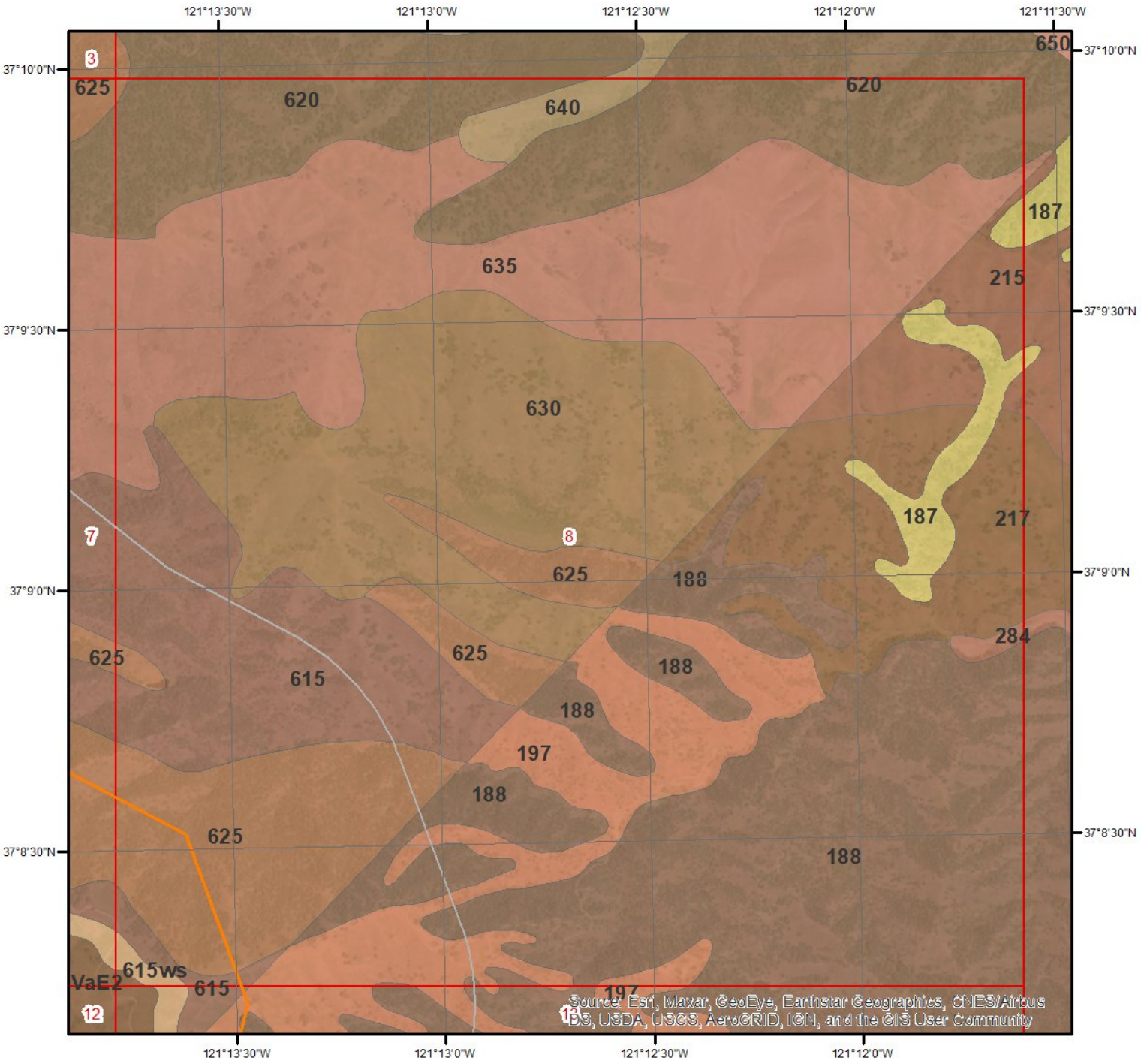
Miles
0 0.2 0.4

N

This maps shows SSURGO soil units around the target property. Please refer to the report for detailed soil descriptions.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Soil Information



SSURGO Soils - Page 8

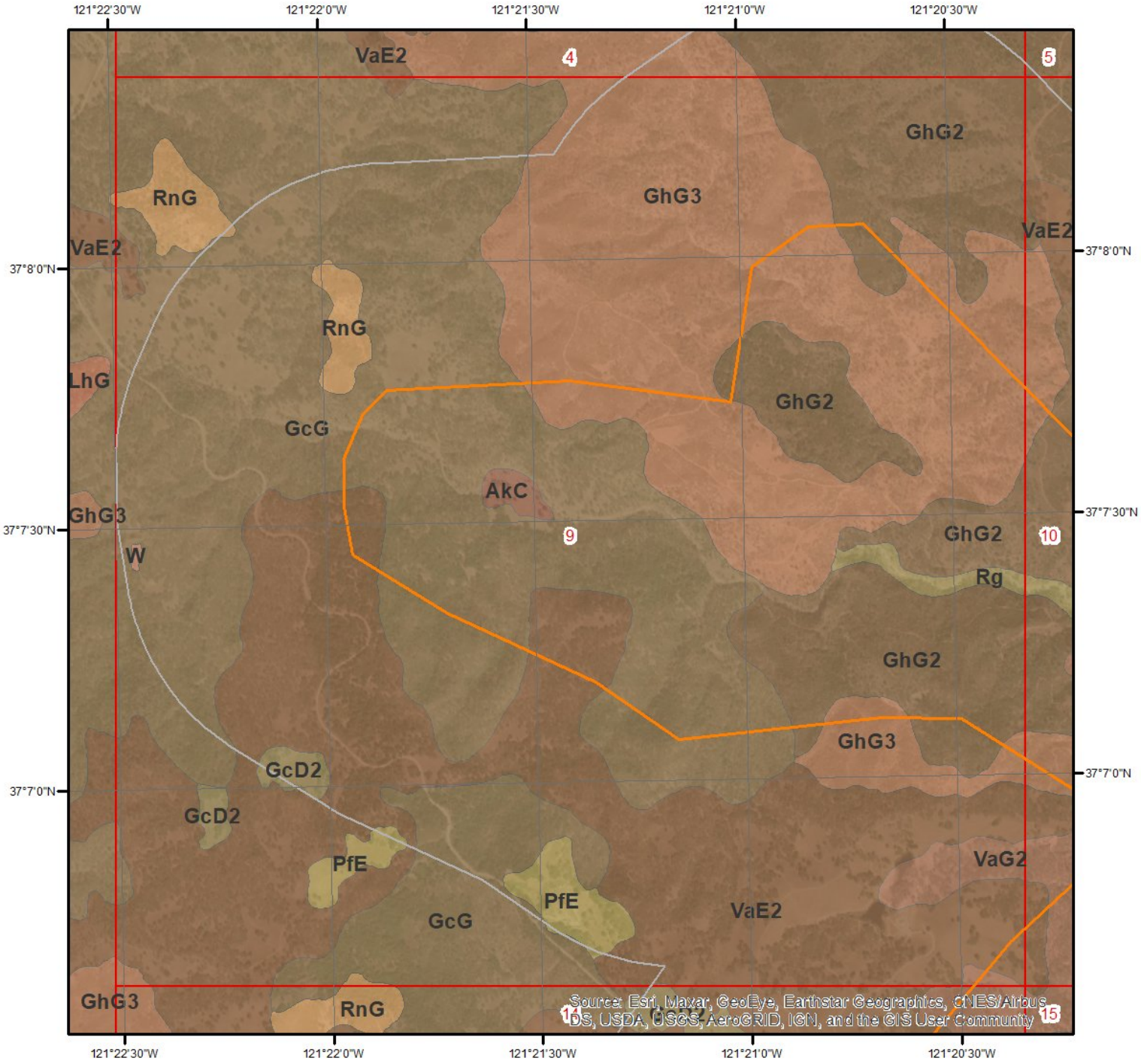
0 0.2 0.4 Miles

N

This maps shows SSURGO soil units around the target property. Please refer to the report for detailed soil descriptions.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Soil Information



SSURGO Soils - Page 9

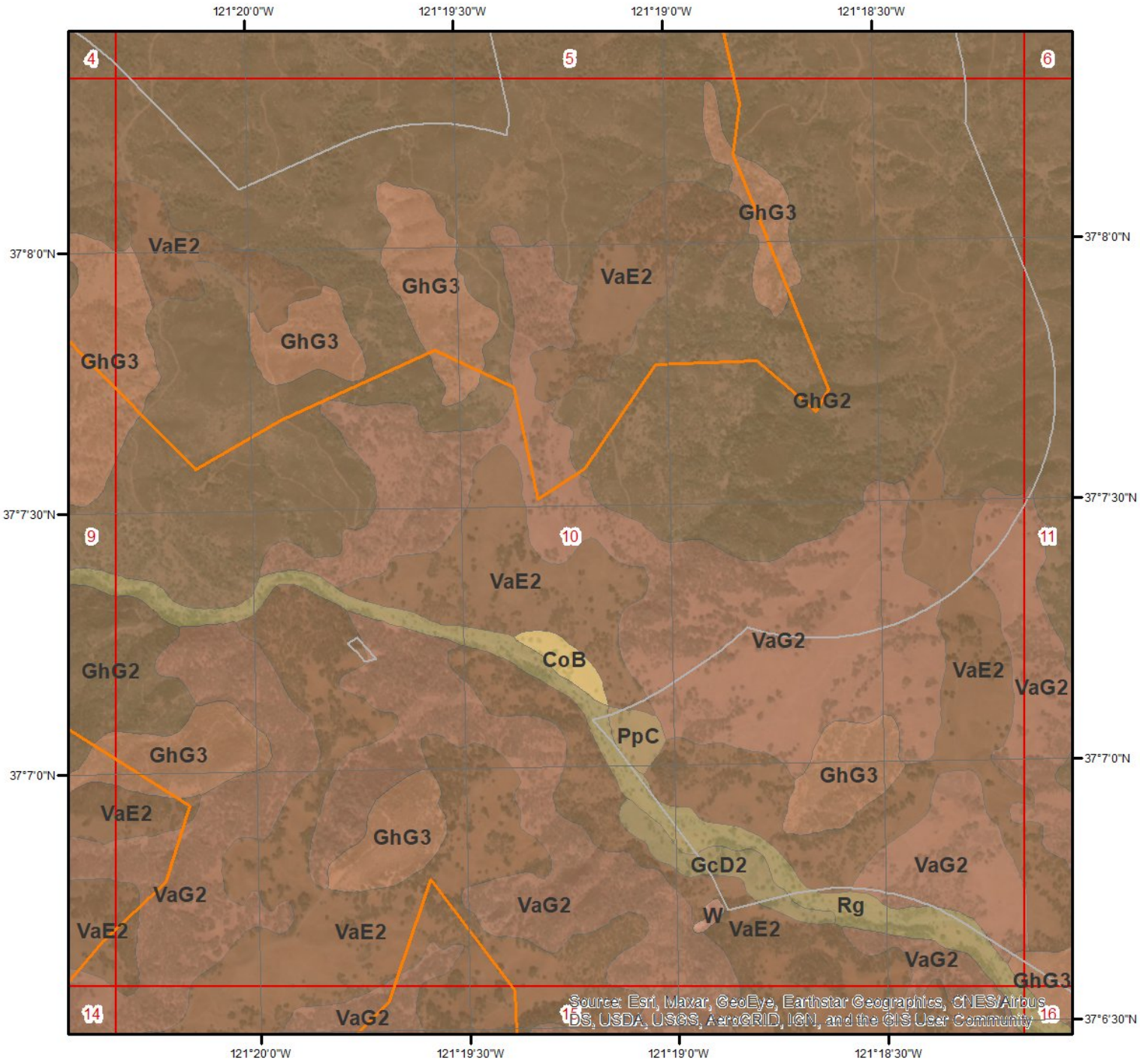
Miles
0 0.2 0.4

N

This maps shows SSURGO soil units around the target property. Please refer to the report for detailed soil descriptions.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Soil Information



SSURGO Soils - Page 10

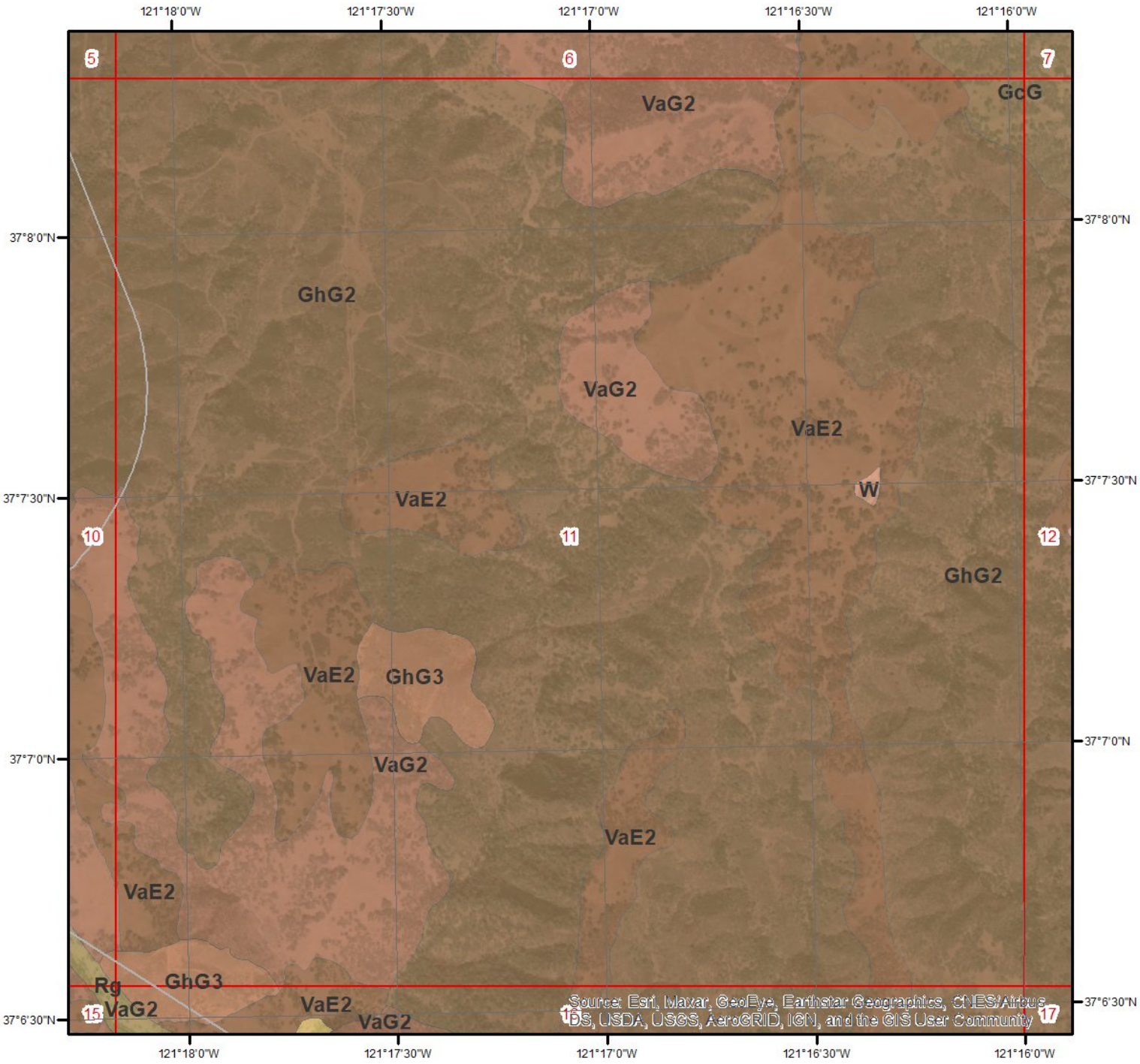
Miles
0 0.2 0.4

N

This maps shows SSURGO soil units around the target property. Please refer to the report for detailed soil descriptions.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Soil Information



SSURGO Soils - Page 11

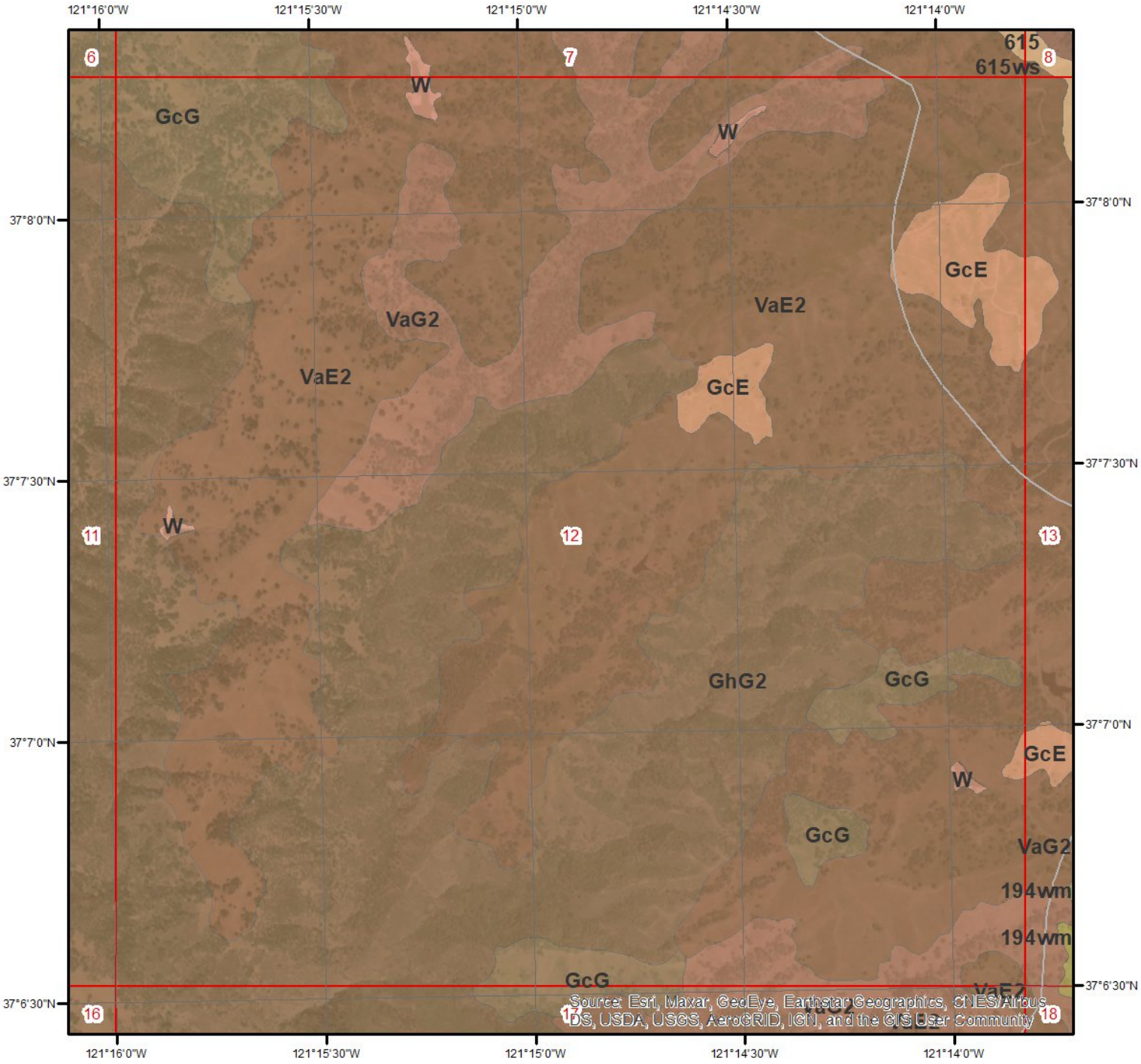
Miles
0 0.2 0.4

N

This maps shows SSURGO soil units around the target property. Please refer to the report for detailed soil descriptions.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Soil Information



SSURGO Soils - Page 12

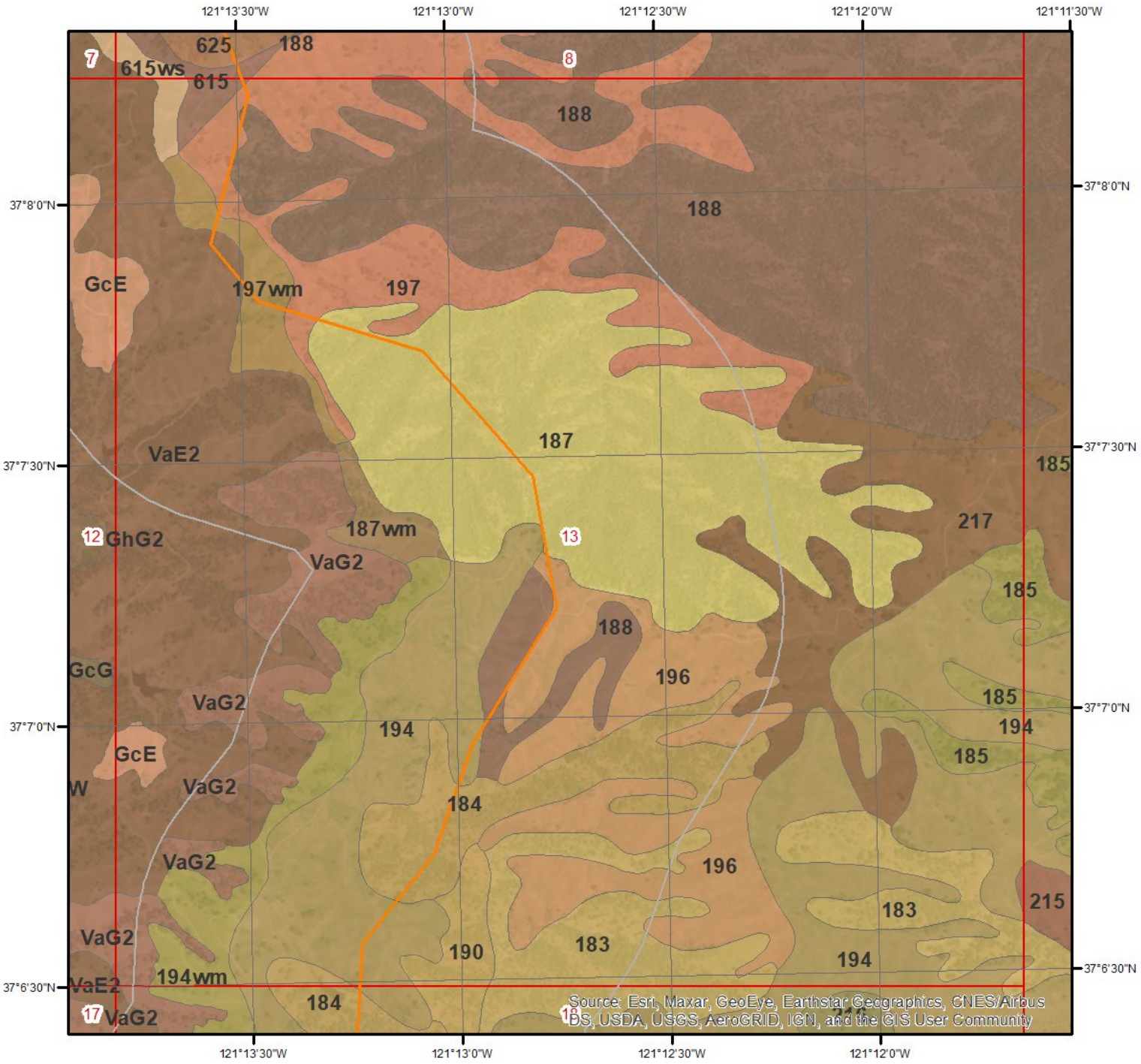
Miles
0 0.2 0.4

N

This maps shows SSURGO soil units around the target property. Please refer to the report for detailed soil descriptions.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Soil Information



SSURGO Soils - Page 13

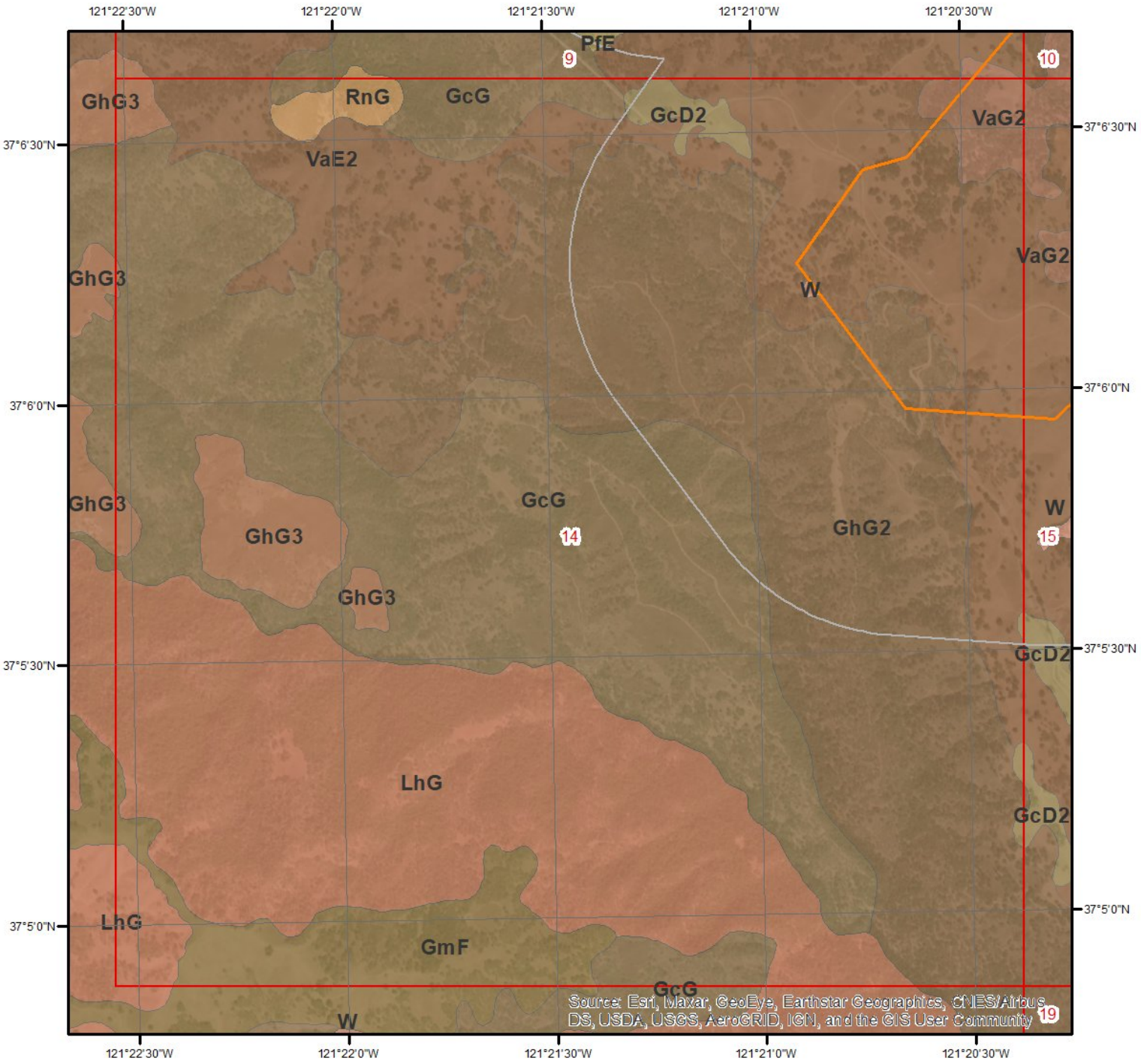
Miles
0 0.2 0.4

N

This maps shows SSURGO soil units around the target property. Please refer to the report for detailed soil descriptions.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Soil Information



SSURGO Soils - Page 14

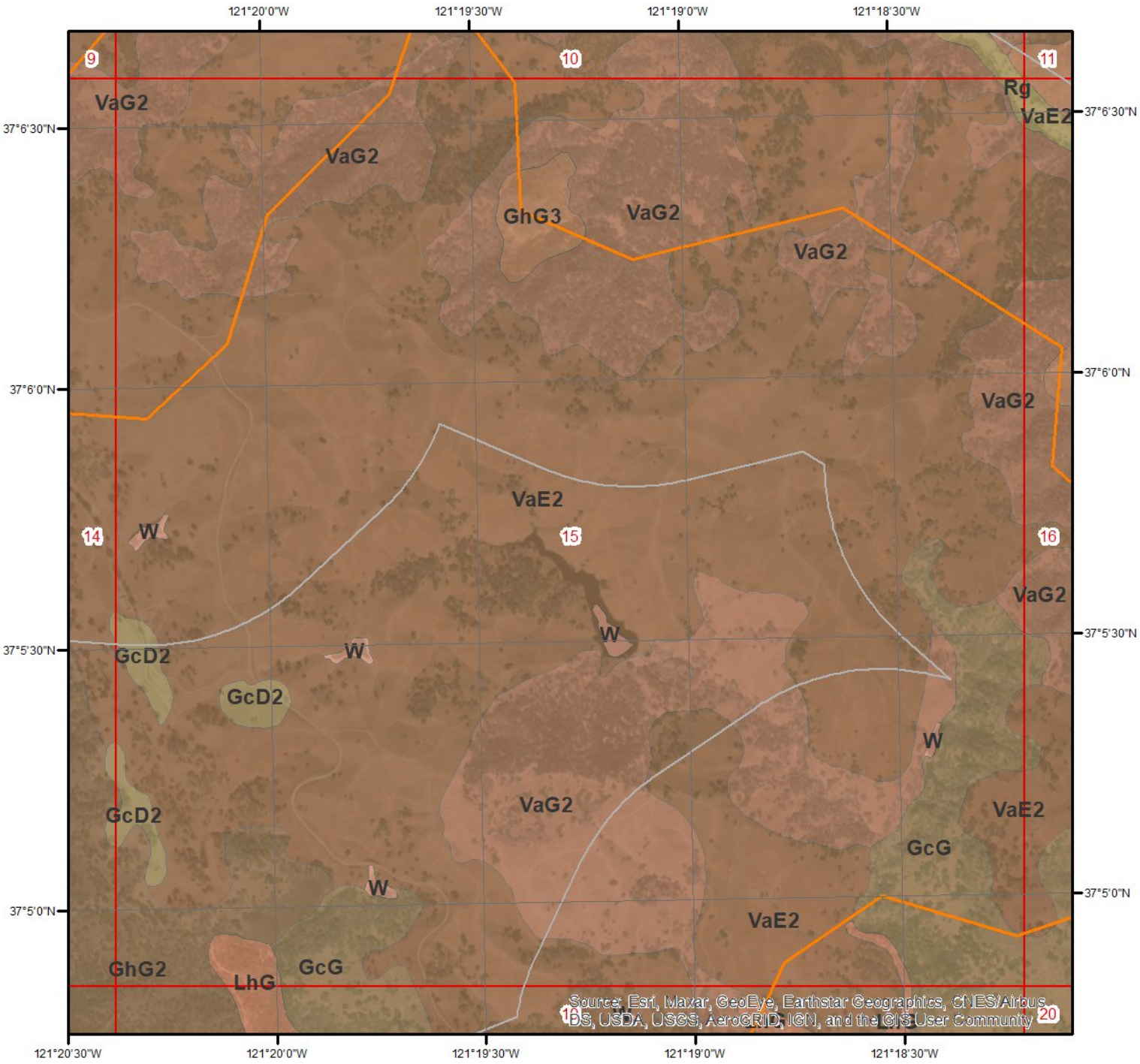
0 0.2 0.4 Miles

N

This maps shows SSURGO soil units around the target property. Please refer to the report for detailed soil descriptions.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Soil Information



SSURGO Soils - Page 15

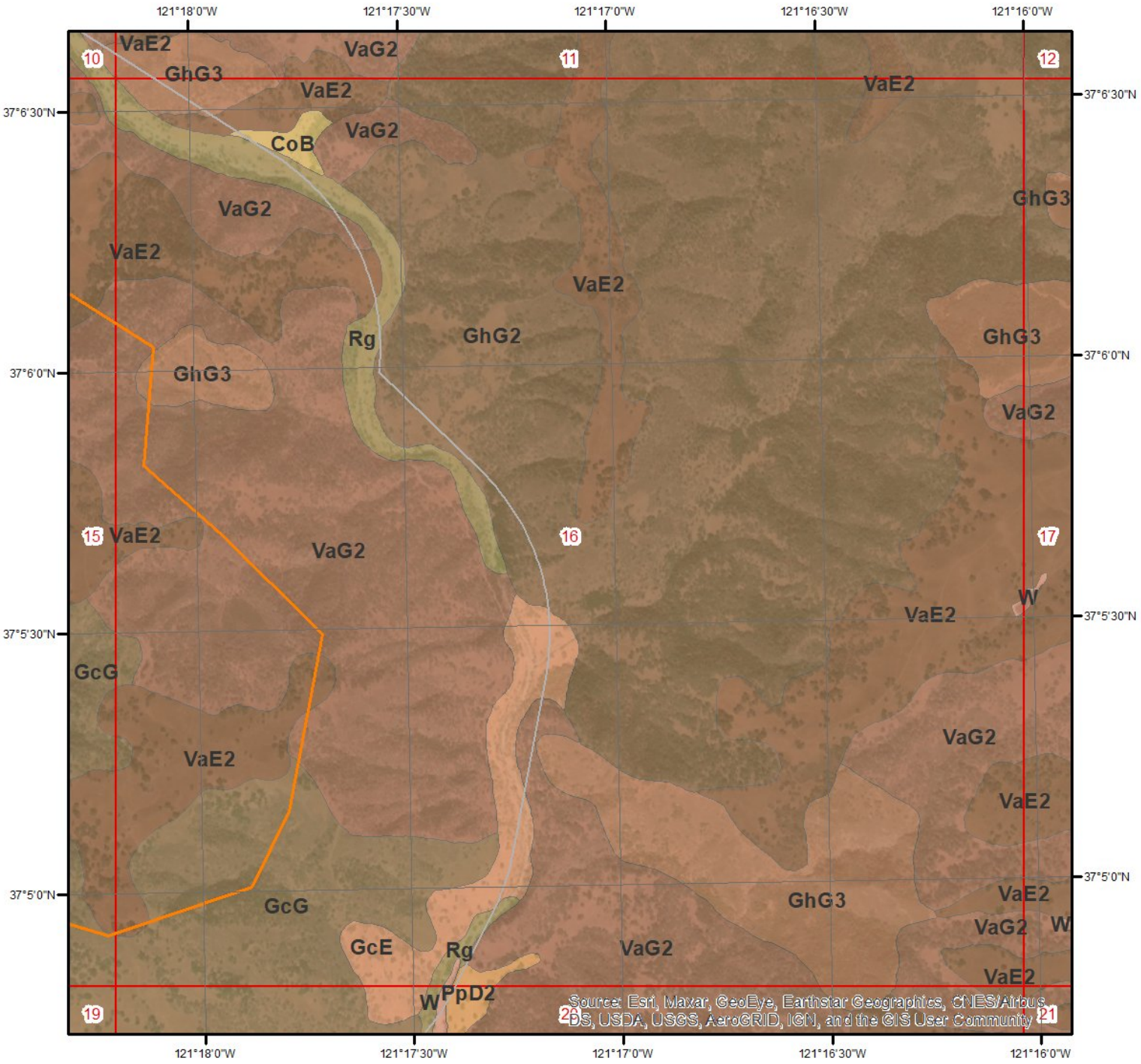
0 0.2 0.4 Miles

N

This maps shows SSURGO soil units around the target property. Please refer to the report for detailed soil descriptions.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Soil Information



SSURGO Soils - Page 16

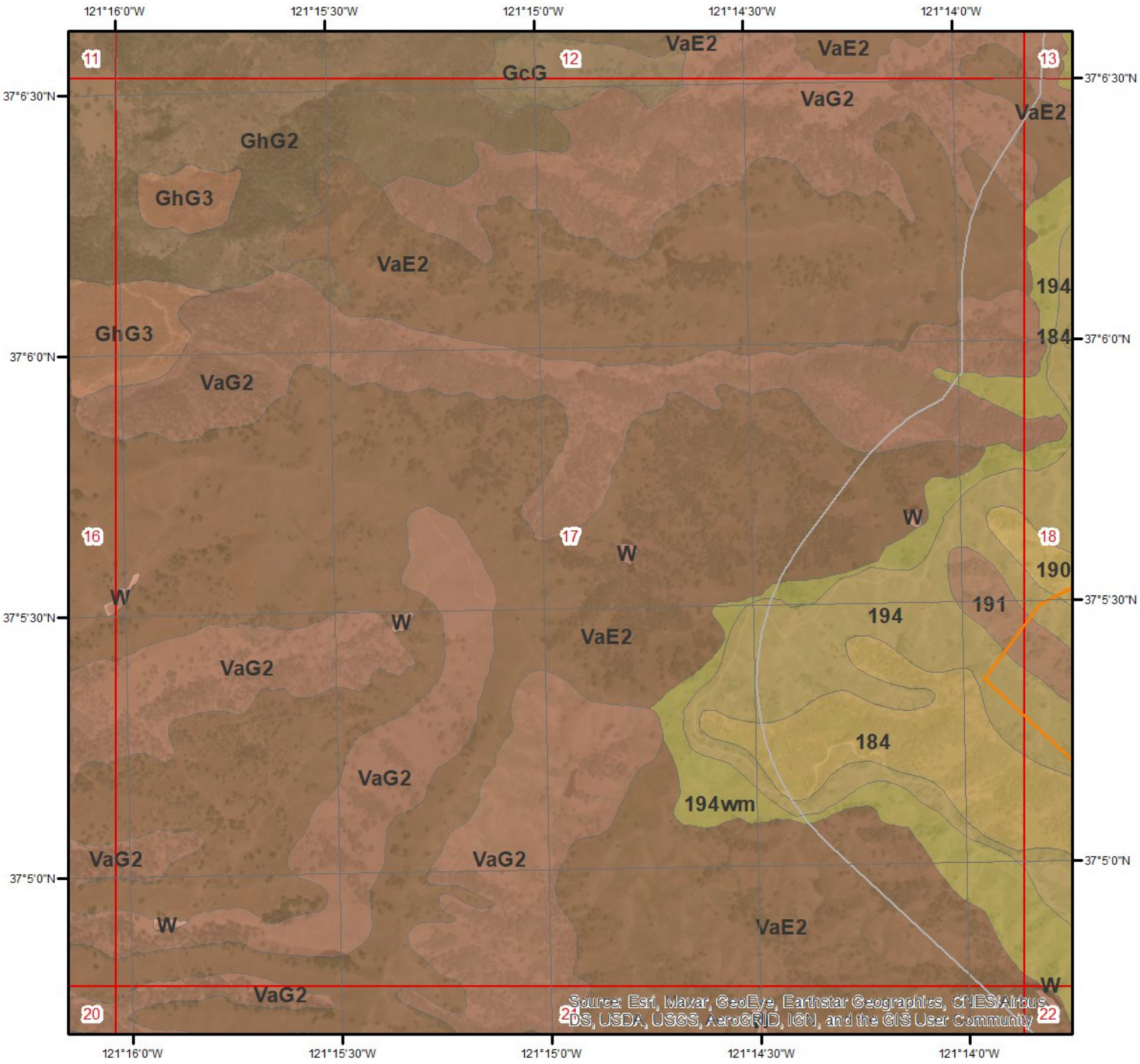
Miles
0 0.2 0.4

N

This maps shows SSURGO soil units around the target property. Please refer to the report for detailed soil descriptions.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Soil Information



SSURGO Soils - Page 17

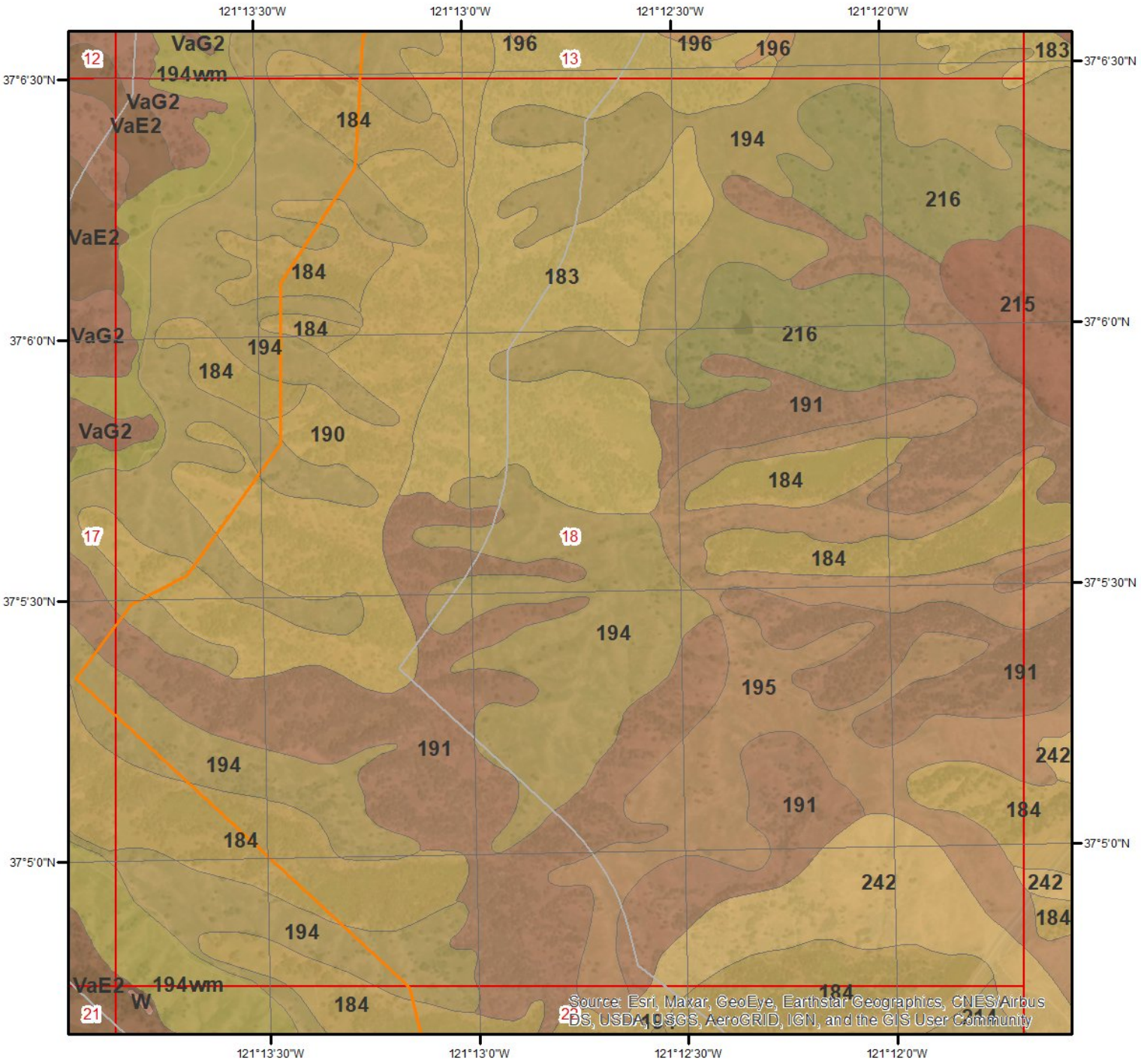
Miles
0 0.2 0.4

N

This maps shows SSURGO soil units around the target property. Please refer to the report for detailed soil descriptions.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Soil Information



SSURGO Soils - Page 18

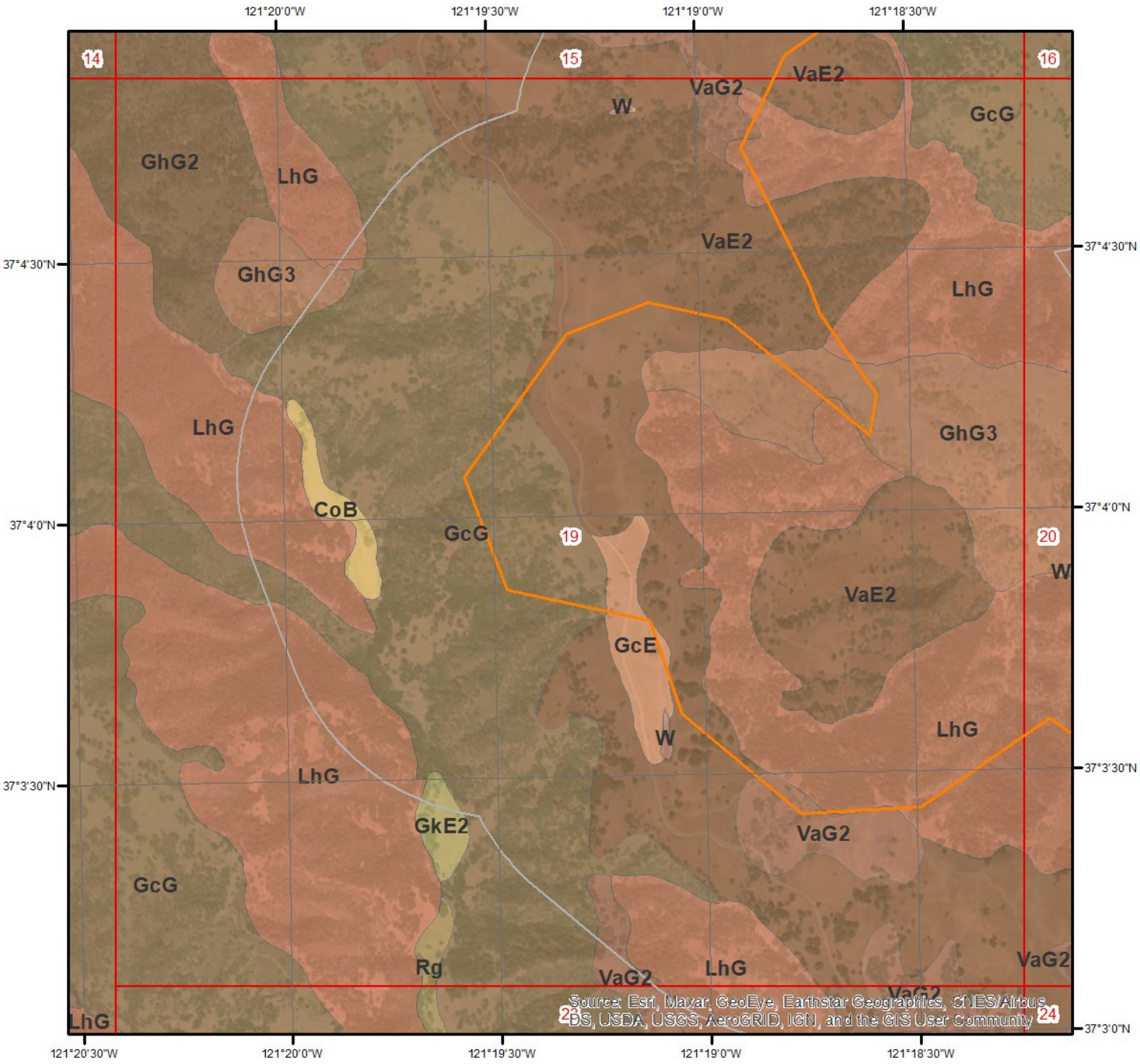
Miles
0 0.2 0.4

N

This maps shows SSURGO soil units around the target property. Please refer to the report for detailed soil descriptions.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Soil Information



SSURGO Soils - Page 19

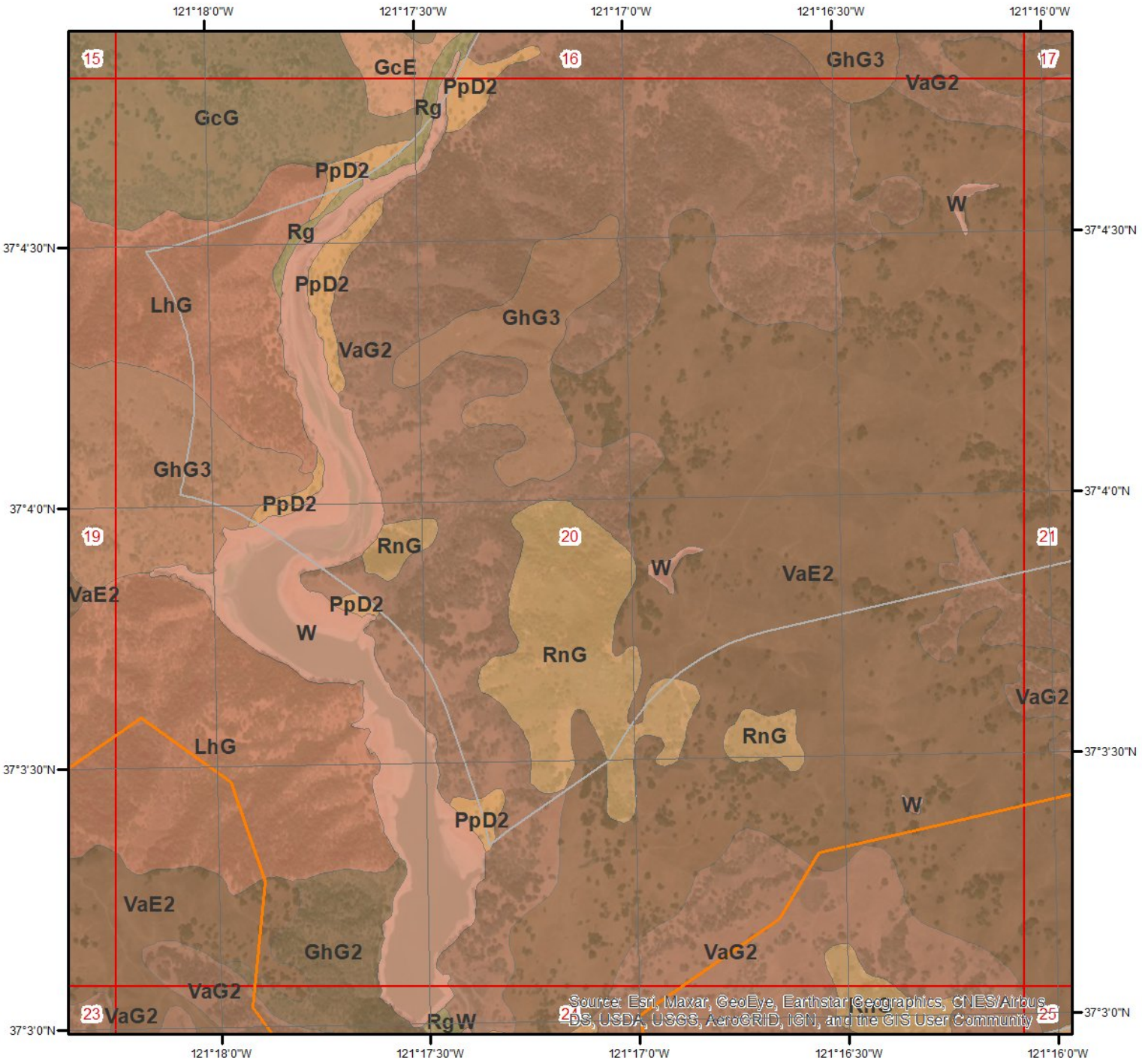
Miles
0 0.2 0.4

N

This maps shows SSURGO soil units around the target property. Please refer to the report for detailed soil descriptions.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Soil Information



SSURGO Soils - Page 20

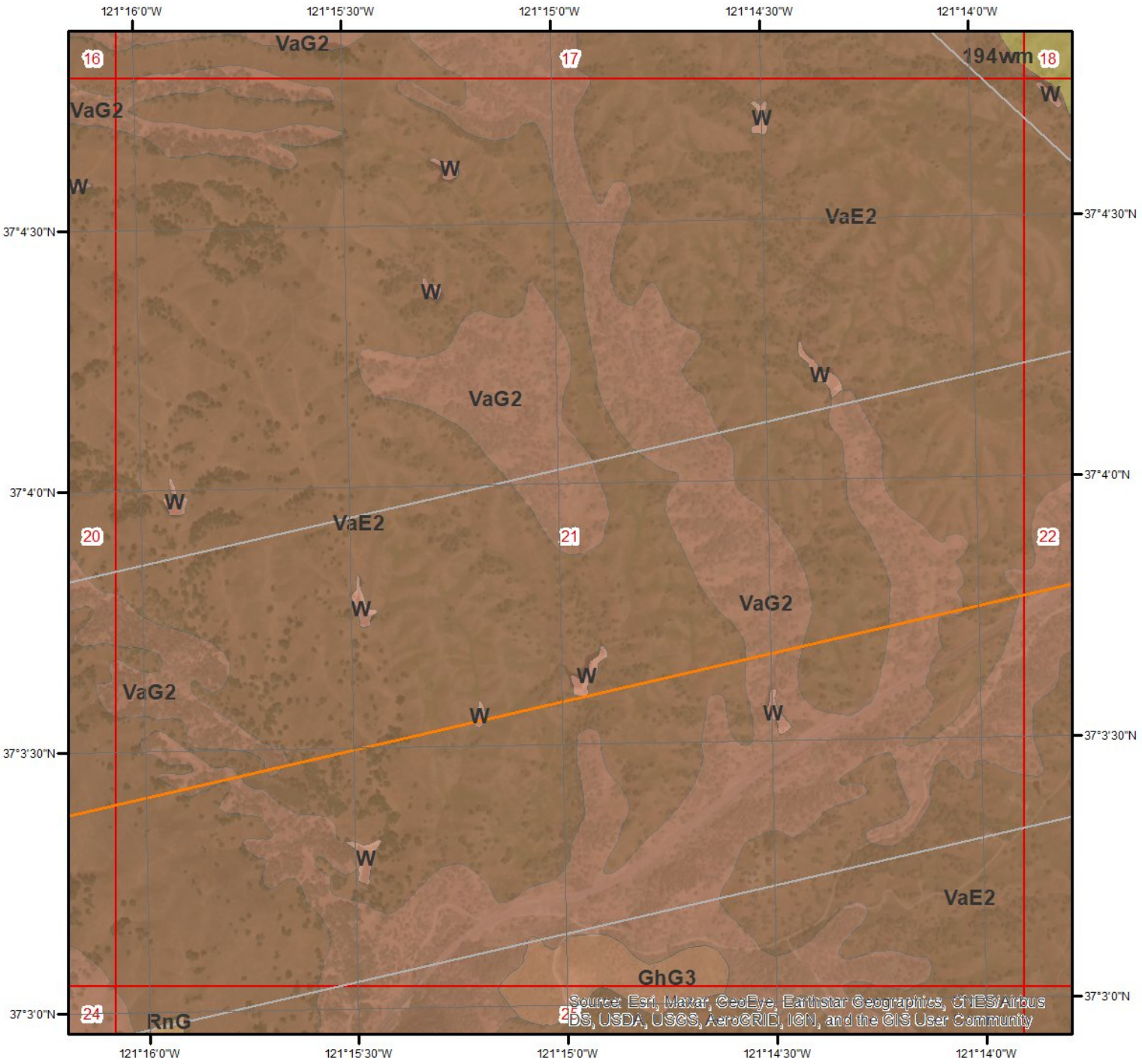
0 0.2 0.4 Miles

N

This maps shows SSURGO soil units around the target property. Please refer to the report for detailed soil descriptions.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Soil Information



SSURGO Soils - Page 21

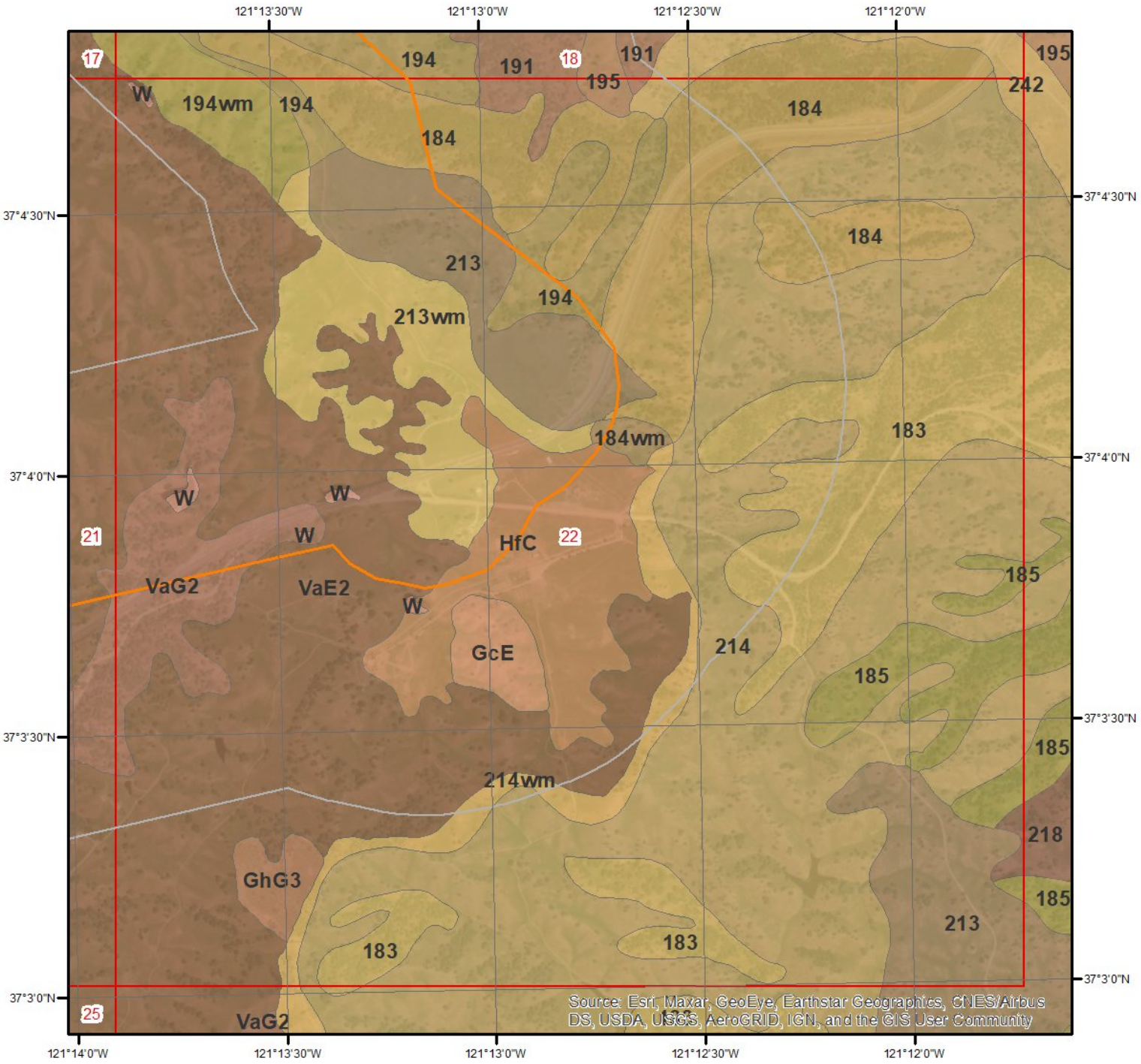
Miles
0 0.2 0.4

N

This maps shows SSURGO soil units around the target property. Please refer to the report for detailed soil descriptions.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Soil Information



SSURGO Soils - Page 22

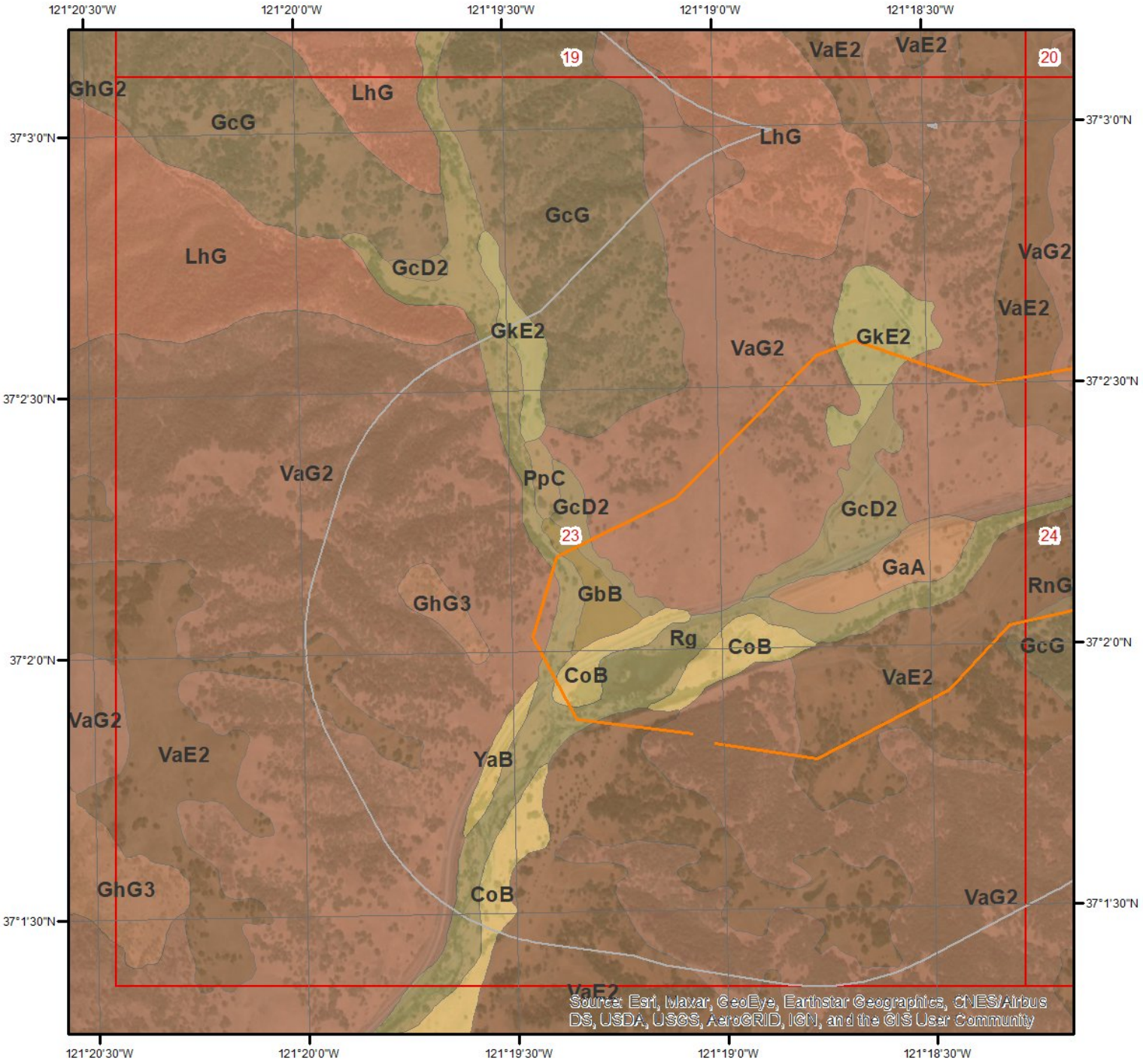
Miles
0 0.2 0.4

N

This maps shows SSURGO soil units around the target property. Please refer to the report for detailed soil descriptions.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Soil Information



SSURGO Soils - Page 23

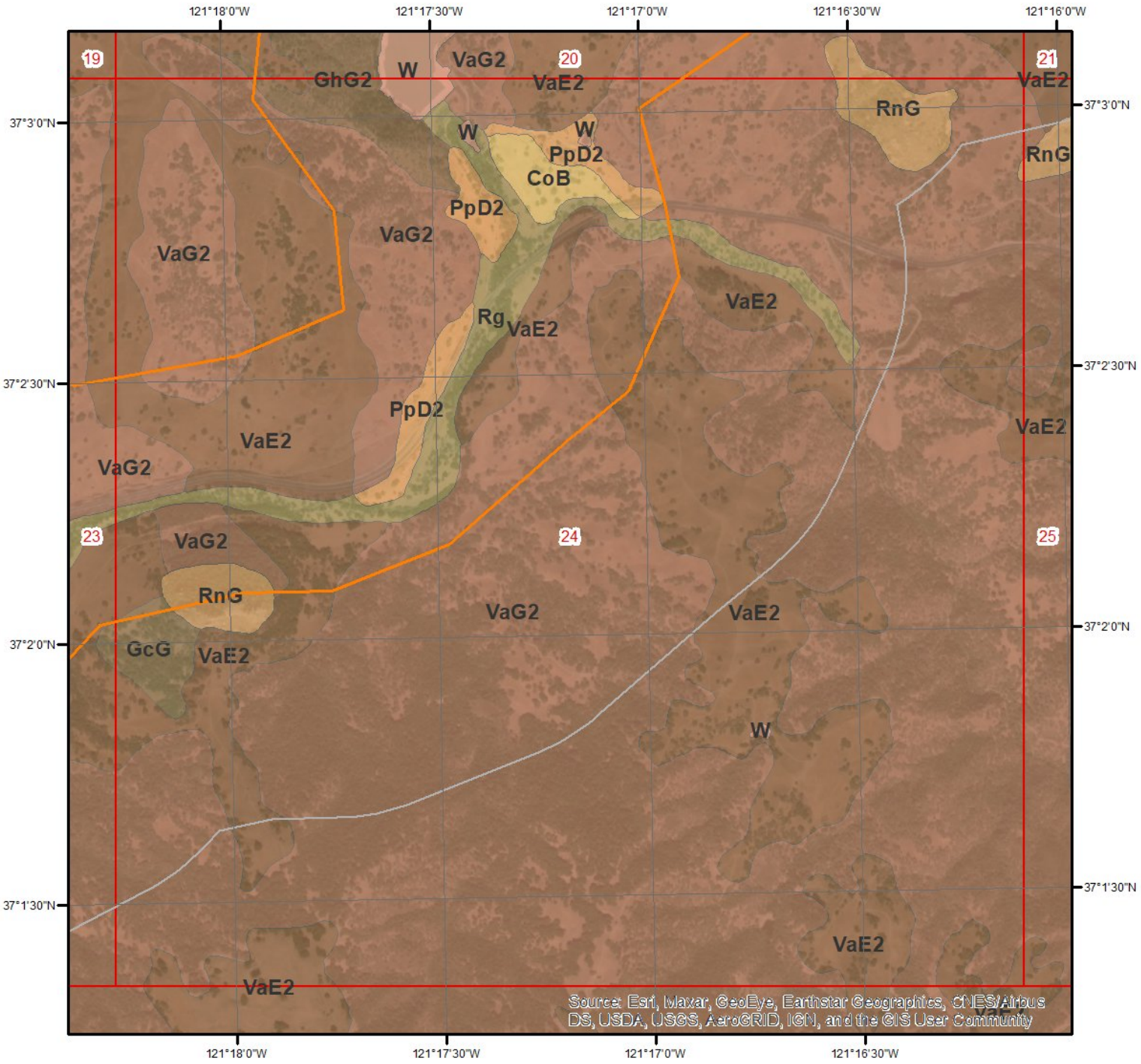
Miles
0 0.2 0.4

N

This maps shows SSURGO soil units around the target property. Please refer to the report for detailed soil descriptions.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Soil Information



SSURGO Soils - Page 24

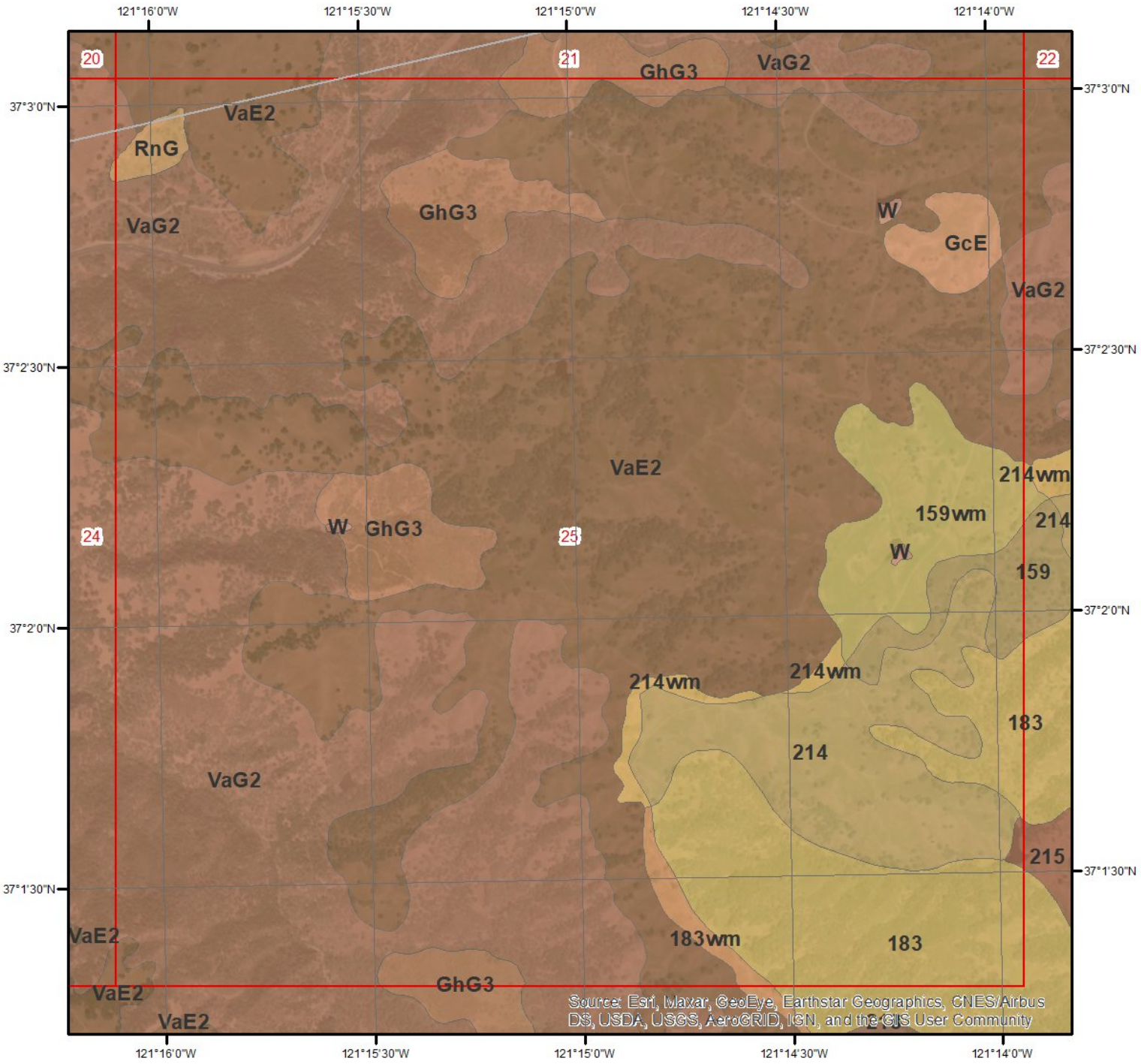
Miles
0 0.2 0.4

N

This maps shows SSURGO soil units around the target property. Please refer to the report for detailed soil descriptions.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Soil Information



SSURGO Soils - Page 25

Miles
0 0.2 0.4

N

This maps shows SSURGO soil units around the target property. Please refer to the report for detailed soil descriptions.

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Soil Information

The previous page shows a soil map using SSURGO data from USDA Natural Resources Conservation Service. Detailed information about each unit is provided below.

Map Unit 183 (0.83%)

Map Unit Name:	Fifield-Gonzaga complex, 30 to 50 percent slopes
Bedrock Depth - Min:	76cm
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	C - Soils in this group have moderately high runoff potential when thoroughly wet. Water transmission through the soil is somewhat restricted.
Major components are printed below	
Fifield(60%)	
horizon H1(0cm to 13cm)	Sandy loam
horizon H2(13cm to 38cm)	Very gravelly loam
horizon H3(38cm to 76cm)	Extremely gravelly loam
horizon H4(76cm to 86cm)	Unweathered bedrock
Gonzaga(25%)	
horizon H1(0cm to 41cm)	Loam
horizon H2(41cm to 56cm)	Gravelly loam
horizon H3(56cm to 99cm)	Gravelly clay loam
horizon H4(99cm to 109cm)	Unweathered bedrock

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 183 - Fifiled-Gonzaga complex, 30 to 50 percent slopes, MLRA 15

Component: Fifield (60%)
The Fifield component makes up 60 percent of the map unit. Slopes are 30 to 50 percent. This component is on mountains, mountains. The parent material consists of residuum weathered from metamorphic and sedimentary rock. Depth to a root restrictive layer, bedrock, lithic, is 20 to 35 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 3 percent. This component is in the F015XE078CA Unspecified ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria.

Component: Gonzaga (25%)
The Gonzaga component makes up 25 percent of the map unit. Slopes are 30 to 50 percent. This component is on mountains, mountains. The parent material consists of residuum weathered from metamorphic and sedimentary rock. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 3 percent. This component is in the F015XE078CA Unspecified ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria.

Component: Honker (3%)
Generated brief soil descriptions are created for major soil components. The Honker soil is a minor component.

Component: Fifield (3%)
Generated brief soil descriptions are created for major soil components. The Fifield soil is a minor component.

Component: Gonzaga (3%)
Generated brief soil descriptions are created for major soil components. The Gonzaga soil is a minor component.

Component: Rock outcrop (2%)
Generated brief soil descriptions are created for major soil components. The Rock outcrop soil is a minor component.

Soil Information

Component: Franciscan (2%)
Generated brief soil descriptions are created for major soil components. The Franciscan soil is a minor component.

Component: Fifield (2%)
Generated brief soil descriptions are created for major soil components. The Fifield soil is a minor component.

Map Unit 184 (0.87%)

Map Unit Name:	Fifield-Honker-Gonzaga complex, 50 to 65 percent slopes
Bedrock Depth - Min:	76cm
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	C - Soils in this group have moderately high runoff potential when thoroughly wet. Water transmission through the soil is somewhat restricted.

Major components are printed below

Fifield(40%)	
horizon H1(0cm to 13cm)	Sandy loam
horizon H2(13cm to 38cm)	Very gravelly loam
horizon H3(38cm to 76cm)	Extremely gravelly loam
horizon H4(76cm to 86cm)	Unweathered bedrock
Honker(25%)	
horizon H1(0cm to 18cm)	Sandy loam
horizon H2(18cm to 36cm)	Sandy clay loam
horizon H3(36cm to 76cm)	Clay
horizon H4(76cm to 97cm)	Gravelly clay loam
horizon H5(97cm to 122cm)	Unweathered bedrock
Gonzaga(20%)	
horizon H1(0cm to 41cm)	Loam
horizon H2(41cm to 56cm)	Gravelly loam
horizon H3(56cm to 99cm)	Gravelly clay loam
horizon H4(99cm to 109cm)	Unweathered bedrock

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 184 - Fifield-Honker-Gonzaga complex, 50 to 65 percent slopes, MLRA 15

Component: Fifield (40%)
The Fifield component makes up 40 percent of the map unit. Slopes are 50 to 60 percent. This component is on mountains, mountains. The parent material consists of residuum weathered from metamorphic and sedimentary rock. Depth to a root restrictive layer, bedrock, lithic, is 20 to 35 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 3 percent. This component is in the F015XE078CA Unspecified ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Component: Honker (25%)
The Honker component makes up 25 percent of the map unit. Slopes are 50 to 65 percent. This component is on mountains, mountains. The parent material consists of residuum weathered from sedimentary rock. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the R015XE001CA Clayey Hills 10-14" P.z. ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Component: Gonzaga (20%)
The Gonzaga component makes up 20 percent of the map unit. Slopes are 50 to 65 percent. This component is on mountains, mountains. The parent material consists of residuum weathered from metamorphic and sedimentary rock. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is

moderately low. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 3 percent. This component is in the F015XE078CA Unspecified ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Component: Franciscan (3%)
Generated brief soil descriptions are created for major soil components. The Franciscan soil is a minor component.

Component: Gonzaga (3%)
Generated brief soil descriptions are created for major soil components. The Ganzaga soil is a minor component.

Component: Fifield (3%)
Generated brief soil descriptions are created for major soil components. The Fifield soil is a minor component.

Component: Millsholm (3%)
Generated brief soil descriptions are created for major soil components. The Millsholm soil is a minor component.

Component: Rock outcrop (3%)
Generated brief soil descriptions are created for major soil components. The Rock outcrop soil is a minor component.

Map Unit 184wm (0.01%)

Map Unit Name:	Fifield-Honker-Gonzaga complex, 50 to 65 percent slopes
Bedrock Depth - Min:	76cm
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	C - Soils in this group have moderately high runoff potential when thoroughly wet. Water transmission through the soil is somewhat restricted.

Major components are printed below

Fifield(40%)	
horizon H1(0cm to 13cm)	Sandy loam
horizon H2(13cm to 38cm)	Very gravelly loam
horizon H2(13cm to 38cm)	Very gravelly sandy clay loam
horizon H3(38cm to 76cm)	Extremely gravelly loam
horizon H3(38cm to 76cm)	Extremely gravelly sandy loam
horizon H4(76cm to 86cm)	Unweathered bedrock
Honker(25%)	
horizon H1(0cm to 18cm)	Sandy loam
horizon H2(18cm to 36cm)	Clay loam
horizon H2(18cm to 36cm)	Loam
horizon H2(18cm to 36cm)	Sandy clay loam
horizon H3(36cm to 76cm)	Clay
horizon H3(36cm to 76cm)	Clay loam
horizon H3(36cm to 76cm)	Sandy clay
horizon H4(76cm to 97cm)	Gravelly clay
horizon H4(76cm to 97cm)	Gravelly clay loam
horizon H4(76cm to 97cm)	Gravelly sandy clay
horizon H5(97cm to 107cm)	Unweathered bedrock
Gonzaga(20%)	
horizon H1(0cm to 41cm)	Loam
horizon H2(41cm to 56cm)	Gravelly loam
horizon H2(41cm to 56cm)	Gravelly sandy clay loam
horizon H3(56cm to 99cm)	Gravelly clay
horizon H3(56cm to 99cm)	Gravelly clay loam
horizon H3(56cm to 99cm)	Gravelly sandy clay
horizon H4(99cm to 109cm)	Unweathered bedrock

Component Description:

Soil Information

Minor map unit components are excluded from this report.

Map Unit: 184wm - Fifield-Honker-Gonzaga complex, 50 to 65 percent slopes, MLRA 15

Component: Fifield (40%)
The Fifield component makes up 40 percent of the map unit. Slopes are 50 to 60 percent. This component is on mountains, mountains. The parent material consists of residuum weathered from metamorphic and sedimentary rock. Depth to a root restrictive layer, bedrock, lithic, is 20 to 35 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 3 percent. This component is in the F015XE078CA Unspecified ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Component: Honker (25%)
The Honker component makes up 25 percent of the map unit. Slopes are 50 to 65 percent. This component is on mountains, mountains. The parent material consists of residuum weathered from sedimentary rock. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the R015XE001CA Clayey Hills 10-14" P.z. ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Component: Gonzaga (20%)
The Gonzaga component makes up 20 percent of the map unit. Slopes are 50 to 65 percent. This component is on mountains, mountains. The parent material consists of residuum weathered from metamorphic and sedimentary rock. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 3 percent. This component is in the F015XE078CA Unspecified ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Component: Rock outcrop (3%)
Generated brief soil descriptions are created for major soil components. The Rock outcrop soil is a minor component.

Component: Fifield (3%)
Generated brief soil descriptions are created for major soil components. The Fifield soil is a minor component.

Component: Millsholm (3%)
Generated brief soil descriptions are created for major soil components. The Millsholm soil is a minor component.

Component: Gonzaga (3%)
Generated brief soil descriptions are created for major soil components. The Ganzaga soil is a minor component.

Component: Franciscan (3%)
Generated brief soil descriptions are created for major soil components. The Franciscan soil is a minor component.

Map Unit 187 (0.49%)

Map Unit Name:	FRANCISCAN SANDY LOAM, 50 TO 70 PERCENT SLOPES
Bedrock Depth - Min:	97cm
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	C - Soils in this group have moderately high runoff potential when thoroughly wet. Water transmission through the soil is somewhat restricted.

Major components are printed below

Franciscan(85%)

horizon H1(0cm to 25cm)	Sandy loam
horizon H2(25cm to 66cm)	Sandy clay loam
horizon H3(66cm to 97cm)	Gravelly sandy clay loam
horizon H4(97cm to 107cm)	Unweathered bedrock

Soil Information

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 187 - Franciscan sandy loam, 50 to 70 percent slopes, MLRA 15

Component: Franciscan (85%)
The Franciscan component makes up 85 percent of the map unit. Slopes are 50 to 70 percent. This component is on mountain slopes, mountains. The parent material consists of residuum weathered from metamorphic and sedimentary rock. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 3 percent. This component is in the F015XE078CA Unspecified ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Component: Gonzaga (6%)
Generated brief soil descriptions are created for major soil components. The Gonzaga soil is a minor component.

Component: Quinto (4%)
Generated brief soil descriptions are created for major soil components. The Quinto soil is a minor component.

Component: Rock outcrop (3%)
Generated brief soil descriptions are created for major soil components. The Rock outcrop soil is a minor component.

Component: Ayar (1%)
Generated brief soil descriptions are created for major soil components. The Ayar soil is a minor component.

Component: Fifield (1%)
Generated brief soil descriptions are created for major soil components. The Fifield soil is a minor component.

Map Unit 187wm (0.02%)

Map Unit Name:	Franciscan sandy loam, 50 to 70 percent slopes
Bedrock Depth - Min:	97cm
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	C - Soils in this group have moderately high runoff potential when thoroughly wet. Water transmission through the soil is somewhat restricted.

Major components are printed below

Franciscan(85%)

horizon H1(0cm to 25cm)	Sandy loam
horizon H2(25cm to 66cm)	Sandy clay loam
horizon H3(66cm to 97cm)	Gravelly sandy clay loam
horizon H4(97cm to 107cm)	Unweathered bedrock

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 187wm - Franciscan sandy loam, 50 to 70 percent slopes, MLRA 15

Component: Franciscan (85%)
The Franciscan component makes up 85 percent of the map unit. Slopes are 50 to 70 percent. This component is on mountain slopes, mountains. The parent material consists of residuum weathered from metamorphic and sedimentary rock. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 3 percent. This component is in the F015XE078CA Unspecified ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Soil Information

Component: Gonzaga (6%)
Generated brief soil descriptions are created for major soil components. The Gonzaga soil is a minor component.

Component: Quinto (4%)
Generated brief soil descriptions are created for major soil components. The Quinto soil is a minor component.

Component: Rock outcrop (3%)
Generated brief soil descriptions are created for major soil components. The Rock outcrop soil is a minor component.

Component: Fifield (1%)
Generated brief soil descriptions are created for major soil components. The Fifield soil is a minor component.

Component: Ayar (1%)
Generated brief soil descriptions are created for major soil components. The Ayar soil is a minor component.

Map Unit 188 (2.87%)

Map Unit Name:	FRANCISCAN-QUINTO-HONKER COMPLEX, 50 TO 75 PERCENT SLOPES
Bedrock Depth - Min:	43cm
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.

Major components are printed below

Franciscan(40%)	
horizon H1(0cm to 25cm)	Sandy loam
horizon H2(25cm to 66cm)	Sandy clay loam
horizon H3(66cm to 97cm)	Gravelly sandy clay loam
horizon H4(97cm to 107cm)	Unweathered bedrock
Quinto(25%)	
horizon H1(0cm to 15cm)	Gravelly sandy loam
horizon H2(15cm to 43cm)	Gravelly sandy clay loam
horizon H3(43cm to 53cm)	Unweathered bedrock
Honker(20%)	
horizon H1(0cm to 18cm)	Sandy loam
horizon H2(18cm to 36cm)	Sandy clay loam
horizon H3(36cm to 76cm)	Clay
horizon H4(76cm to 97cm)	Gravelly clay loam
horizon H5(97cm to 122cm)	Unweathered bedrock

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 188 - Franciscan-Quinto-Honker complex, 50 to 75 percent slopes, MLRA 15

Component: Franciscan (40%)
The Franciscan component makes up 40 percent of the map unit. Slopes are 50 to 75 percent. This component is on mountains, mountains. The parent material consists of residuum weathered from sandstone. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 3 percent. This component is in the F015XE078CA Unspecified ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria.

Component: Quinto (25%)
The Quinto component makes up 25 percent of the map unit. Slopes are 50 to 75 percent. This component is on mountains, mountains. The parent material consists of residuum weathered from sandstone. Depth to a root restrictive layer, bedrock, lithic, is 10 to 20 inches. The natural drainage class is somewhat excessively drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not

flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the R015XE080CA Shallow Coarse Loamy 10-16 ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria.

Component: Honker (20%)
The Honker component makes up 20 percent of the map unit. Slopes are 50 to 75 percent. This component is on mountains, mountains. The parent material consists of residuum weathered from sandstone. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the R015XE001CA Clayey Hills 10-14" P.z. ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria.

Component: Millsholm (7%)
Generated brief soil descriptions are created for major soil components. The Millsholm soil is a minor component.

Component: Rock outcrop (3%)
Generated brief soil descriptions are created for major soil components. The Rock outcrop soil is a minor component.

Component: Gonzaga (3%)
Generated brief soil descriptions are created for major soil components. The Gonzaga soil is a minor component.

Component: Fifield (2%)
Generated brief soil descriptions are created for major soil components. The Fifield soil is a minor component.

Map Unit 190 (0.33%)

Map Unit Name:	GONZAGA-HONKER COMPLEX, 30 TO 50 PERCENT SLOPES
Bedrock Depth - Min:	97cm
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	C - Soils in this group have moderately high runoff potential when thoroughly wet. Water transmission through the soil is somewhat restricted.
Major components are printed below	
Gonzaga(60%)	
horizon H1(0cm to 41cm)	Loam
horizon H2(41cm to 56cm)	Gravelly loam
horizon H3(56cm to 99cm)	Gravelly clay loam
horizon H4(99cm to 109cm)	Unweathered bedrock
Honker(25%)	
horizon H1(0cm to 18cm)	Sandy loam
horizon H2(18cm to 36cm)	Sandy clay loam
horizon H3(36cm to 76cm)	Clay
horizon H4(76cm to 97cm)	Gravelly clay loam
horizon H5(97cm to 122cm)	Unweathered bedrock

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 190 - Gonzaga-Honker , 30 to 50 percent slopes

Component: Gonzaga (60%)
The GONZAGA component makes up 60 percent of the map unit. Slopes are 30 to 50 percent. This component is on mountains. The parent material consists of residuum weathered from metamorphic and sedimentary rock. Depth to a root restrictive layer, bedrock, lithic, is 39 to 43 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is low. Available water to a depth of 60 inches is low. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 6e. This soil does not meet hydric criteria.

Component: Honker (25%)
The HONKER component makes up 25 percent of the map unit. Slopes are 30 to 50 percent. This component is on mountains. The parent material consists of residuum weathered from sedimentary rock. Depth to a root restrictive layer, bedrock, lithic, is 38 to 42 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is low. Available water to a depth of 60 inches is low. Shrink-swell potential is high. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the R015XE001CA Clayey Hills 10-14" P.z. ecological site. Nonirrigated land capability classification is 6e. This soil does not meet hydric criteria.

Component: Franciscan (4%)
Generated brief soil descriptions are created for major components. The FRANCISCAN soil is a minor component.

Component: Contra Costa (4%)
Generated brief soil descriptions are created for major components. The CONTRA COSTA soil is a minor component.

Component: Rock outcrop (4%)
Generated brief soil descriptions are created for major components. The ROCK OUTCROP soil is a minor component.

Component: Millsholm (3%)
Generated brief soil descriptions are created for major components. The MILLSHOLM soil is a minor component.

Map Unit 191 (0.48%)

Map Unit Name:	GONZAGA-HONKER COMPLEX, 50 TO 65 PERCENT SLOPES
Bedrock Depth - Min:	97cm
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	C - Soils in this group have moderately high runoff potential when thoroughly wet. Water transmission through the soil is somewhat restricted.

Major components are printed below

Gonzaga(60%)	
horizon H1(0cm to 41cm)	Loam
horizon H2(41cm to 56cm)	Gravelly loam
horizon H3(56cm to 99cm)	Gravelly clay loam
horizon H4(99cm to 109cm)	Unweathered bedrock
Honker(25%)	
horizon H1(0cm to 18cm)	Sandy loam
horizon H2(18cm to 36cm)	Sandy clay loam
horizon H3(36cm to 76cm)	Clay
horizon H4(76cm to 97cm)	Gravelly clay loam
horizon H5(97cm to 122cm)	Unweathered bedrock

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 191 - Gonzaga-Honker , 50 to 65 percent slopes

Component: Gonzaga (60%)
The GONZAGA component makes up 60 percent of the map unit. Slopes are 50 to 65 percent. This component is on mountains. The parent material consists of residuum weathered from metamorphic and sedimentary rock. Depth to a root restrictive layer, bedrock, lithic, is 39 to 43 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is low. Available water to a depth of 60 inches is low. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria.

Component: Honker (25%)
The HONKER component makes up 25 percent of the map unit. Slopes are 50 to 60 percent. This component is on mountains. The parent material consists of residuum weathered from sedimentary rock. Depth to a root restrictive layer, bedrock, lithic, is 38 to 42 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is low. Available water to a depth of 60 inches is low. Shrink-swell potential is high. This soil is not flooded. It is not ponded. There is no zone of water saturation within a

depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the R015XE001CA Clayey Hills 10-14" P.z. ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria.

Component: Rock 0utcrop (4%)
Generated brief soil descriptions are created for major components. The ROCK 0UTCROP soil is a minor component.

Component: Franciscan (4%)
Generated brief soil descriptions are created for major components. The FRANCISCAN soil is a minor component.

Component: Contra Costa (4%)
Generated brief soil descriptions are created for major components. The CONTRA COSTA soil is a minor component.

Component: Millsholm (3%)
Generated brief soil descriptions are created for major components. The MILLSHOLM soil is a minor component.

Map Unit 194 (1.46%)

Map Unit Name:	HONKER SANDY LOAM, 30 TO 50 PERCENT SLOPES
Bedrock Depth - Min:	97cm
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.

Major components are printed below

Honker(85%)

horizon H1(0cm to 18cm)	Sandy loam
horizon H2(18cm to 36cm)	Sandy clay loam
horizon H3(36cm to 76cm)	Clay
horizon H4(76cm to 97cm)	Gravelly clay loam
horizon H5(97cm to 122cm)	Unweathered bedrock

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 194 - Honker sandy loam, 30 to 50 percent slopes

Component: Honker (85%)
The HONKER component makes up 85 percent of the map unit. Slopes are 30 to 50 percent. This component is on mountains. The parent material consists of residuum weathered from sedimentary rock. Depth to a root restrictive layer, bedrock, lithic, is 38 to 42 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is low. Available water to a depth of 60 inches is low. Shrink-swell potential is high. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the R015XE001CA Clayey Hills 10-14" P.z. ecological site. Nonirrigated land capability classification is 6e. This soil does not meet hydric criteria.

Component: Rock outcrop (4%)
Generated brief soil descriptions are created for major components. The ROCK OUTCROP soil is a minor component.

Component: Millsholm (4%)
Generated brief soil descriptions are created for major components. The MILLSHOLM soil is a minor component.

Component: Honker (4%)
Generated brief soil descriptions are created for major components. The HONKER soil is a minor component.

Component: Contra Costa (3%)
Generated brief soil descriptions are created for major components. The CONTRA COSTA soil is a minor component.

Map Unit 194wm (0.34%)

Map Unit Name:	Honker sandy loam, 30 to 50 percent slopes

Soil Information

Bedrock Depth - Min:	97cm
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.

Major components are printed below

Honker(85%)

horizon H1(0cm to 18cm)	Sandy loam
horizon H2(18cm to 36cm)	Clay loam
horizon H2(18cm to 36cm)	Loam
horizon H2(18cm to 36cm)	Sandy clay loam
horizon H3(36cm to 76cm)	Clay
horizon H3(36cm to 76cm)	Clay loam
horizon H3(36cm to 76cm)	Sandy clay
horizon H4(76cm to 97cm)	Gravelly clay
horizon H4(76cm to 97cm)	Gravelly clay loam
horizon H4(76cm to 97cm)	Gravelly sandy clay
horizon H5(97cm to 107cm)	Unweathered bedrock

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 194wm - Honker sandy loam, 30 to 50 percent slopes

Component: Honker (85%)
The Honker component makes up 85 percent of the map unit. Slopes are 30 to 50 percent. This component is on mountain slopes. The parent material consists of residuum weathered from sandstone. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is low. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is high. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the R015XE001CA Clayey Hills 10-14" P.z. ecological site. Nonirrigated land capability classification is 6e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Component: Rock outcrop (4%)
Generated brief soil descriptions are created for major components. The Rock outcrop soil is a minor component.

Component: Millsholm (4%)
Generated brief soil descriptions are created for major components. The Millsholm soil is a minor component.

Component: Honker (4%)
Generated brief soil descriptions are created for major components. The Honker soil is a minor component.

Component: Contra Costa (3%)
Generated brief soil descriptions are created for major components. The Contra Costa soil is a minor component.

Map Unit 195 (0.45%)

Map Unit Name:	Honker sandy loam, 50 to 65 percent slopes
Bedrock Depth - Min:	97cm
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.

Major components are printed below

Honker(85%)

horizon H1(0cm to 18cm)	Sandy loam
horizon H2(18cm to 36cm)	Sandy clay loam

horizon H3(36cm to 76cm)	Clay
horizon H4(76cm to 97cm)	Gravelly clay loam
horizon H5(97cm to 122cm)	Unweathered bedrock

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 195 - Honker sandy loam, 50 to 65 percent slopes

Component: Honker (85%)
The HONKER component makes up 85 percent of the map unit. Slopes are 50 to 65 percent. This component is on mountains. The parent material consists of residuum weathered from sedimentary rock. Depth to a root restrictive layer, bedrock, lithic, is 38 to 42 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is low. Available water to a depth of 60 inches is low. Shrink-swell potential is high. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the R015XE001CA Clayey Hills 10-14" P.z. ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria.

Component: Millsholm (4%)
Generated brief soil descriptions are created for major components. The MILLSHOLM soil is a minor component.

Component: Honker (4%)
Generated brief soil descriptions are created for major components. The HONKER, 30 TO 50% SLOPES soil is a minor component.

Component: Rock outcrop (4%)
Generated brief soil descriptions are created for major components. The ROCK OUTCROP soil is a minor component.

Component: Contra Costa (3%)
Generated brief soil descriptions are created for major components. The CONTRA COSTA soil is a minor component.

Map Unit 196 (0.23%)

Map Unit Name:	Honker-Millsholm-Rock outcrop complex, 30 to 50 percent slopes
Bedrock Depth - Min:	0cm
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.

Major components are printed below

Honker(45%)	
horizon H1(0cm to 18cm)	Sandy loam
horizon H2(18cm to 36cm)	Sandy clay loam
horizon H3(36cm to 76cm)	Clay
horizon H4(76cm to 97cm)	Gravelly clay loam
horizon H5(97cm to 122cm)	Unweathered bedrock
Millsholm(20%)	
horizon H1(0cm to 48cm)	Loam
horizon H2(48cm to 58cm)	Unweathered bedrock
Rock outcrop(20%)	
horizon H1(0cm to 25cm)	Unweathered bedrock

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 196 - Honker-Millsholm-Rock outcrop complex, 30 to 50 percent slopes

Component: Honker (45%)
The HONKER component makes up 45 percent of the map unit. Slopes are 30 to 50 percent. This component is on mountains. The parent material consists of residuum weathered from sedimentary rock. Depth to a root restrictive layer, bedrock, lithic, is 38 to 42

inches. The natural drainage class is well drained. Water movement in the most restrictive layer is low. Available water to a depth of 60 inches is low. Shrink-swell potential is high. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the R015XE001CA Clayey Hills 10-14" P.z. ecological site. Nonirrigated land capability classification is 6e. This soil does not meet hydric criteria.

Component: Rock outcrop (20%)
Generated brief soil descriptions are created for major soil components. The ROCK OUTCROP is a miscellaneous area.

Component: Millsholm (20%)
The MILLSHOLM component makes up 20 percent of the map unit. Slopes are 30 to 50 percent. This component is on mountains. The parent material consists of residuum weathered from sandstone and shale. Depth to a root restrictive layer, bedrock, lithic, is 19 to 23 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the R015XE083CA Shallow Loamy Hills 13-18" P.z. ecological site. Nonirrigated land capability classification is 6e. This soil does not meet hydric criteria.

Component: Millsholm (5%)
Generated brief soil descriptions are created for major components. The MILLSHOLM, 50 TO 65% SLOPES soil is a minor component.

Component: Contra Costa (5%)
Generated brief soil descriptions are created for major components. The CONTRA COSTA soil is a minor component.

Component: Honker (5%)
Generated brief soil descriptions are created for major components. The HONKER, 50 TO 65% SLOPES soil is a minor component.

Map Unit 197 (0.47%)

Map Unit Name:	Honker-Quinto complex, 30 to 50 percent slopes
Bedrock Depth - Min:	43cm
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.
Major components are printed below	
Honker(45%)	
horizon H1(0cm to 18cm)	Sandy loam
horizon H2(18cm to 36cm)	Sandy clay loam
horizon H3(36cm to 76cm)	Clay
horizon H4(76cm to 97cm)	Gravelly clay
horizon H5(97cm to 122cm)	Unweathered bedrock
Quinto(40%)	
horizon H1(0cm to 15cm)	Gravelly sandy loam
horizon H2(15cm to 43cm)	Gravelly sandy clay loam
horizon H3(43cm to 53cm)	Unweathered bedrock

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 197 - Honker-Quinto complex, 30 to 50 percent slopes

Component: Honker (45%)
The Honker component makes up 45 percent of the map unit. Slopes are 30 to 50 percent. This component is on mountain slopes. The parent material consists of residuum weathered from sedimentary rock. Depth to a root restrictive layer, bedrock, lithic, is 38 to 42 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is high. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the R015XE001CA Clayey Hills 10-14" P.z. ecological site. Nonirrigated land capability classification is 7e. This soil does not meet

hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Component: Quinto (40%)
The Quinto component makes up 40 percent of the map unit. Slopes are 30 to 50 percent. This component is on mountain slopes. The parent material consists of residuum weathered from conglomerate. Depth to a root restrictive layer, bedrock, lithic, is 17 to 21 inches. The natural drainage class is somewhat excessively drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the R015XE080CA Shallow Coarse Loamy 10-16 ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria.

Component: Quinto (4%)
Generated brief soil descriptions are created for major components. The Quinto soil is a minor component.

Component: Rock outcrop (4%)
Generated brief soil descriptions are created for major components. The Rock outcrop soil is a minor component.

Component: Millsholm (4%)
Generated brief soil descriptions are created for major components. The Millsholm soil is a minor component.

Component: Honker (3%)
Generated brief soil descriptions are created for major components. The Honker soil is a minor component.

Map Unit 197wm (0.04%)

Map Unit Name:	Honker-Quinto complex, 30 to 50 percent slopes
Bedrock Depth - Min:	43cm
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.

Major components are printed below

Honker(45%)	
horizon H1(0cm to 18cm)	Sandy loam
horizon H2(18cm to 36cm)	Sandy clay loam
horizon H3(36cm to 76cm)	Clay
horizon H4(76cm to 97cm)	Gravelly clay
horizon H5(97cm to 122cm)	Unweathered bedrock
Quinto(40%)	
horizon H1(0cm to 15cm)	Gravelly sandy loam
horizon H2(15cm to 43cm)	Gravelly sandy clay loam
horizon H3(43cm to 53cm)	Unweathered bedrock

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 197wm - Honker-Quinto complex, 30 to 50 percent slopes

Component: Honker (45%)
The Honker component makes up 45 percent of the map unit. Slopes are 30 to 50 percent. This component is on mountain slopes. The parent material consists of residuum weathered from sedimentary rock. Depth to a root restrictive layer, bedrock, lithic, is 38 to 42 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is high. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the R015XE001CA Clayey Hills 10-14" P.z. ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Component: Quinto (40%)
The Quinto component makes up 40 percent of the map unit. Slopes are 30 to 50 percent. This component is on mountain slopes.

Soil Information

The parent material consists of residuum weathered from conglomerate. Depth to a root restrictive layer, bedrock, lithic, is 17 to 21 inches. The natural drainage class is somewhat excessively drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the R015XE080CA Shallow Coarse Loamy 10-16 ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria.

Component: Millsholm (4%)
Generated brief soil descriptions are created for major components. The Millsholm soil is a minor component.

Component: Quinto (4%)
Generated brief soil descriptions are created for major components. The Quinto soil is a minor component.

Component: Rock outcrop (4%)
Generated brief soil descriptions are created for major components. The Rock outcrop soil is a minor component.

Component: Honker (3%)
Generated brief soil descriptions are created for major components. The Honker soil is a minor component.

Map Unit 213 (0.14%)

Map Unit Name:	Millsholm loam, 8 to 15 percent slopes
Bedrock Depth - Min:	48cm
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.

Major components are printed below

Millsholm(85%)

horizon H1(0cm to 48cm)	Loam
horizon H2(48cm to 58cm)	Unweathered bedrock

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 213 - Millsholm loam, 4 to 30 percent slopes, MLRA 15

Component: Millsholm (90%)
The Millsholm component makes up 90 percent of the map unit. Slopes are 4 to 30 percent. This component is on mountain slopes on mountains. The parent material consists of residuum weathered from sandstone and shale. Depth to a root restrictive layer, bedrock, lithic, is 10 to 20 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the R015XE083CA Shallow Loamy Hills ecological site. Nonirrigated land capability classification is 6e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Component: Unnamed (6%)
Generated brief soil descriptions are created for major components. The UNNAMED, SHALLOW soil is a minor component.

Component: Rock outcrop (4%)
Generated brief soil descriptions are created for major components. The ROCK OUTCROP soil is a minor component.

Map Unit 213wm (0.16%)

Map Unit Name:	Millsholm loam, 8 to 15 percent slopes
Bedrock Depth - Min:	48cm
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Well drained

Soil Information

Hydrologic Group - Dominant:	D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.

Major components are printed below

Millsholm(85%)

horizon H1(0cm to 48cm)	Loam
horizon H2(48cm to 58cm)	Unweathered bedrock

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 213wm - Millsholm loam, 4 to 30 percent slopes, MLRA 15

Component: Millsholm (90%)
The Millsholm component makes up 90 percent of the map unit. Slopes are 4 to 30 percent. This component is on mountain slopes on mountains. The parent material consists of residuum weathered from sandstone and shale. Depth to a root restrictive layer, bedrock, lithic, is 10 to 20 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the R015XE083CA Shallow Loamy Hills ecological site. Nonirrigated land capability classification is 6e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Component: Unnamed (6%)
Generated brief soil descriptions are created for major components. The UNNAMED, SHALLOW soil is a minor component.

Component: Rock outcrop (4%)
Generated brief soil descriptions are created for major components. The ROCK OUTCROP soil is a minor component.

Map Unit 214 (3.11%)

Map Unit Name:	MILLSHOLM LOAM, 30 TO 50 PERCENT SLOPES
Bedrock Depth - Min:	48cm
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.

Major components are printed below

Millsholm(85%)

horizon H1(0cm to 48cm)	Loam
horizon H2(48cm to 58cm)	Unweathered bedrock

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 214 - Millsholm loam, 15 to 45 percent slopes, dry, MLRA 15

Component: Millsholm (85%)
The Millsholm, dry component makes up 85 percent of the map unit. Slopes are 15 to 45 percent. This component is on mountain slopes on mountains. The parent material consists of residuum weathered from sandstone and shale. Depth to a root restrictive layer, bedrock, lithic, is 10 to 20 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the R015XE083CA Shallow Loamy Hills ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Component: Contra Costa (4%)
Generated brief soil descriptions are created for major components. The CONTRA COSTA soil is a minor component.

Component: Fifield (4%)
Generated brief soil descriptions are created for major components. The FIFIELD soil is a minor component.

Soil Information

Component: Honker (4%)
Generated brief soil descriptions are created for major components. The HONKER soil is a minor component.

Component: Rock outcrop (3%)
Generated brief soil descriptions are created for major components. The ROCK OUTCROP soil is a minor component.

Map Unit 214wm (0.16%)

Map Unit Name:	Millsholm loam, 30 to 50 percent slopes
Bedrock Depth - Min:	48cm
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.

Major components are printed below

Millsholm(85%)

horizon H1(0cm to 48cm)	Loam
horizon H2(48cm to 58cm)	Unweathered bedrock

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 214wm - Millsholm loam, 15 to 45 percent slopes, dry, MLRA 15

Component: Millsholm (85%)
The Millsholm, dry component makes up 85 percent of the map unit. Slopes are 15 to 45 percent. This component is on mountain slopes on mountains. The parent material consists of residuum weathered from sandstone and shale. Depth to a root restrictive layer, bedrock, lithic, is 10 to 20 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the R015XE083CA Shallow Loamy Hills ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Component: Contra Costa (4%)
Generated brief soil descriptions are created for major components. The CONTRA COSTA soil is a minor component.

Component: Fifield (4%)
Generated brief soil descriptions are created for major components. The FIFIELD soil is a minor component.

Component: Honker (4%)
Generated brief soil descriptions are created for major components. The HONKER soil is a minor component.

Component: Rock outcrop (3%)
Generated brief soil descriptions are created for major components. The ROCK OUTCROP soil is a minor component.

Map Unit 217 (1.81%)

Map Unit Name:	Millsholm-Honker-Rock outcrop complex, 30 to 50 percent slopes
Bedrock Depth - Min:	0cm
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.

Major components are printed below

Millsholm(45%)

horizon H1(0cm to 48cm)	Loam
horizon H2(48cm to 58cm)	Unweathered bedrock

Rock outcrop(20%)

horizon H1(0cm to 25cm)	Unweathered bedrock

Honker(20%)

horizon H1(0cm to 18cm)	Sandy loam
horizon H2(18cm to 36cm)	Sandy clay loam
horizon H3(36cm to 76cm)	Clay
horizon H4(76cm to 97cm)	Gravelly clay loam
horizon H5(97cm to 122cm)	Unweathered bedrock

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 217 - Millsholm-Honker-Rock outcrop complex, 15 to 50 percent slopes, MLRA 15

Component: Millsholm (45%)
The Millsholm component makes up 45 percent of the map unit. Slopes are 15 to 50 percent. This component is on mountain slopes on mountains. The parent material consists of residuum weathered from sandstone and shale. Depth to a root restrictive layer, bedrock, lithic, is 10 to 20 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the R015XE083CA Shallow Loamy Hills ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Component: Honker (20%)
The Honker component makes up 20 percent of the map unit. Slopes are 15 to 50 percent. This component is on mountain slopes on mountains. The parent material consists of colluvium derived from sandstone and shale. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the R015XE001CA Clayey Hills 10-14" P.z. ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Component: Rock outcrop (20%)
Generated brief soil descriptions are created for major soil components. The Rock outcrop is a miscellaneous area.

Component: Contra Costa (4%)
Generated brief soil descriptions are created for major soil components. The Contra Costa soil is a minor component.

Component: Quinto (4%)
Generated brief soil descriptions are created for major soil components. The Quinto soil is a minor component.

Component: Honker (4%)
Generated brief soil descriptions are created for major soil components. The Honker soil is a minor component.

Component: Millsholm (3%)
Generated brief soil descriptions are created for major soil components. The Millsholm soil is a minor component.

Map Unit 242 (0.17%)

Map Unit Name:	Quinto-Millsholm-Rock outcrop complex, 40 to 75 percent slopes
Bedrock Depth - Min:	0cm
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Somewhat excessively drained
Hydrologic Group - Dominant:	D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.

Major components are printed below

Quinto(35%)

horizon H1(0cm to 15cm)	Gravelly sandy loam
horizon H2(15cm to 43cm)	Gravelly sandy clay loam

horizon H3(43cm to 53cm)	Unweathered bedrock
Millsholm(30%)	
horizon H1(0cm to 48cm)	Loam
horizon H2(48cm to 58cm)	Unweathered bedrock
Rock outcrop(20%)	
horizon H1(0cm to 25cm)	Unweathered bedrock

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 242 - Quinto-Millsholm-Rock outcrop complex, 40 to 75 percent slopes

Component: Quinto (35%)
The QUINTO component makes up 35 percent of the map unit. Slopes are 40 to 75 percent. This component is on mountains. The parent material consists of residuum weathered from sandstone. Depth to a root restrictive layer, bedrock, lithic, is 17 to 21 inches. The natural drainage class is somewhat excessively drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is very low. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the R015XE080CA Shallow Coarse Loamy 10-16" P.z. ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria.

Component: Millsholm (30%)
The MILLSHOLM component makes up 30 percent of the map unit. Slopes are 40 to 75 percent. This component is on mountains. The parent material consists of residuum weathered from sandstone and shale. Depth to a root restrictive layer, bedrock, lithic, is 19 to 23 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the R015XE083CA Shallow Loamy Hills 13-18" P.z. ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria.

Component: Rock outcrop (20%)
Generated brief soil descriptions are created for major soil components. The ROCK OUTCROP is a miscellaneous area.

Component: Contra Costa (3%)
Generated brief soil descriptions are created for major components. The CONTRA COSTA soil is a minor component.

Component: Quinto (3%)
Generated brief soil descriptions are created for major components. The QUINTO, 25 TO 40% SLOPES soil is a minor component.

Component: Millsholm (3%)
Generated brief soil descriptions are created for major components. The MILLSHOLM, 25 TO 40% SLOPES soil is a minor component.

Component: Honker (3%)
Generated brief soil descriptions are created for major components. The HONKER soil is a minor component.

Component: Wisflat (3%)
Generated brief soil descriptions are created for major components. The WISFLAT soil is a minor component.

Map Unit 600 (0.3%)

Map Unit Name:	Gonzaga-Honker-Franciscan complex, 30 to 50 percent slopes
Bedrock Depth - Min:	74cm
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	C - Soils in this group have moderately high runoff potential when thoroughly wet. Water transmission through the soil is somewhat restricted.

Major components are printed below

Gonzaga(35%)

horizon H1(0cm to 46cm)	Loam
horizon H2(46cm to 74cm)	Gravelly loam
horizon H3(74cm to 97cm)	Gravelly clay
horizon H4(97cm to 107cm)	Unweathered bedrock
Honker(30%)	
horizon H1(0cm to 18cm)	Sandy loam
horizon H2(18cm to 41cm)	Clay loam
horizon H3(41cm to 91cm)	Gravelly clay
horizon H4(91cm to 102cm)	Unweathered bedrock
Franciscan(20%)	
horizon H1(0cm to 36cm)	Gravelly sandy loam
horizon H2(36cm to 74cm)	Cobbly clay loam
horizon H3(74cm to 84cm)	Unweathered bedrock

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 600 - Gonzaga-Honker-Franciscan complex, 30 to 50 percent slopes, MLRA 15

Component: Gonzaga (35%)
The Gonzaga component makes up 35 percent of the map unit. Slopes are 30 to 50 percent. This component is on mountains, mountains. The parent material consists of residuum weathered from shale. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 3 percent. This component is in the F015XE078CA Unspecified ecological site. Nonirrigated land capability classification is 6e. This soil does not meet hydric criteria.

Component: Honker (30%)
The Honker component makes up 30 percent of the map unit. Slopes are 30 to 50 percent. This component is on mountains, mountains. The parent material consists of residuum weathered from sandstone. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the R015XE001CA Clayey Hills 10-14" P.z. ecological site. Nonirrigated land capability classification is 6e. This soil does not meet hydric criteria.

Component: Franciscan (20%)
The Franciscan component makes up 20 percent of the map unit. Slopes are 30 to 50 percent. This component is on mountains, mountains. The parent material consists of residuum weathered from sandstone. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 3 percent. This component is in the F015XE078CA Unspecified ecological site. Nonirrigated land capability classification is 6e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 4 within 30 inches of the soil surface.

Component: Vallecitos (10%)
Generated brief soil descriptions are created for major soil components. The Vallecitos soil is a minor component.

Component: Rock outcrop (5%)
Generated brief soil descriptions are created for major soil components. The Rock outcrop soil is a minor component.

Map Unit 601 (0.85%)

Map Unit Name:	Gonzaga-Honker-Franciscan complex, 50 to 75 percent slopes
Bedrock Depth - Min:	74cm
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Well drained

Soil Information

Hydrologic Group - Dominant:	C - Soils in this group have moderately high runoff potential when thoroughly wet. Water transmission through the soil is somewhat restricted.

Major components are printed below

Gonzaga(35%)	
horizon H1(0cm to 46cm)	Loam
horizon H2(46cm to 74cm)	Gravelly loam
horizon H3(74cm to 97cm)	Gravelly clay
horizon H4(97cm to 107cm)	Unweathered bedrock
Honker(30%)	
horizon H1(0cm to 18cm)	Sandy loam
horizon H2(18cm to 41cm)	Clay loam
horizon H3(41cm to 91cm)	Gravelly clay
horizon H4(91cm to 102cm)	Unweathered bedrock
Franciscan(20%)	
horizon H1(0cm to 36cm)	Gravelly sandy loam
horizon H2(36cm to 74cm)	Cobbly clay loam
horizon H3(74cm to 84cm)	Unweathered bedrock

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 601 - Gonzaga-Honker-Franciscan complex, 50 to 75 percent slopes, MLRA 15

Component: Gonzaga (35%)
The Gonzaga component makes up 35 percent of the map unit. Slopes are 50 to 75 percent. This component is on mountains, mountains. The parent material consists of residuum weathered from shale. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 3 percent. This component is in the F015XE078CA Unspecified ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria.

Component: Honker (30%)
The Honker component makes up 30 percent of the map unit. Slopes are 50 to 75 percent. This component is on mountains, mountains. The parent material consists of residuum weathered from sandstone. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the R015XE001CA Clayey Hills 10-14" P.z. ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria.

Component: Franciscan (20%)
The Franciscan component makes up 20 percent of the map unit. Slopes are 50 to 75 percent. This component is on mountains, mountains. The parent material consists of residuum weathered from sandstone. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 3 percent. This component is in the F015XE078CA Unspecified ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 4 within 30 inches of the soil surface.

Component: Rock outcrop (8%)
Generated brief soil descriptions are created for major soil components. The Rock outcrop soil is a minor component.

Component: Vallecitos (7%)
Generated brief soil descriptions are created for major soil components. The Vallecitos soil is a minor component.

Map Unit 601ws (0.13%)

Map Unit Name:	Gonzaga-Honker-Franciscan complex, 50 to 75 percent slopes

Soil Information

Bedrock Depth - Min:	74cm
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	C - Soils in this group have moderately high runoff potential when thoroughly wet. Water transmission through the soil is somewhat restricted.

Major components are printed below

Gonzaga(35%)	
horizon H1(0cm to 46cm)	Loam
horizon H2(46cm to 74cm)	Gravelly loam
horizon H2(46cm to 74cm)	Gravelly sandy clay loam
horizon H3(74cm to 97cm)	Gravelly clay
horizon H3(74cm to 97cm)	Gravelly clay loam
horizon H3(74cm to 97cm)	Gravelly sandy clay
horizon H4(97cm to 107cm)	Unweathered bedrock
Honker(30%)	
horizon H1(0cm to 18cm)	Sandy loam
horizon H2(18cm to 41cm)	Clay loam
horizon H2(18cm to 41cm)	Loam
horizon H2(18cm to 41cm)	Sandy clay loam
horizon H3(41cm to 91cm)	Gravelly clay
horizon H3(41cm to 91cm)	Gravelly clay loam
horizon H3(41cm to 91cm)	Gravelly sandy clay
horizon H4(91cm to 102cm)	Unweathered bedrock
Franciscan(20%)	
horizon H1(0cm to 36cm)	Gravelly sandy loam
horizon H2(36cm to 74cm)	Cobbly clay loam
horizon H2(36cm to 74cm)	Cobbly loam
horizon H2(36cm to 74cm)	Gravelly loam
horizon H3(74cm to 84cm)	Unweathered bedrock

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 601ws - Gonzaga-Honker-Franciscan complex, 50 to 75 percent slopes, MLRA 15

Component: Gonzaga (35%)
The Gonzaga component makes up 35 percent of the map unit. Slopes are 50 to 75 percent. This component is on mountains, mountains. The parent material consists of residuum weathered from shale. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 3 percent. This component is in the F015XE078CA Unspecified ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria.

Component: Honker (30%)
The Honker component makes up 30 percent of the map unit. Slopes are 50 to 75 percent. This component is on mountains, mountains. The parent material consists of residuum weathered from sandstone. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the R015XE001CA Clayey Hills 10-14" P.z. ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria.

Component: Franciscan (20%)
The Franciscan component makes up 20 percent of the map unit. Slopes are 50 to 75 percent. This component is on mountains, mountains. The parent material consists of residuum weathered from sandstone. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 3 percent. This component is in

the F015XE078CA Unspecified ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 4 within 30 inches of the soil surface.

Component: Rock outcrop (8%)
Generated brief soil descriptions are created for major soil components. The Rock outcrop soil is a minor component.

Component: Vallecitos (7%)
Generated brief soil descriptions are created for major soil components. The Vallecitos soil is a minor component.

Map Unit 615 (0.49%)

Map Unit Name:	Honker-Quinto complex, 30 to 50 percent slopes
Bedrock Depth - Min:	43cm
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.

Major components are printed below

Honker(45%)	
horizon H1(0cm to 18cm)	Sandy loam
horizon H2(18cm to 41cm)	Clay loam
horizon H3(41cm to 91cm)	Gravelly clay
horizon H4(91cm to 102cm)	Unweathered bedrock
Quinto(40%)	
horizon H1(0cm to 15cm)	Gravelly sandy loam
horizon H2(15cm to 43cm)	Gravelly sandy clay loam
horizon H3(43cm to 48cm)	Unweathered bedrock

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 615 - Honker-Quinto complex, 30 to 50 percent slopes

Component: Honker (45%)
The Honker component makes up 45 percent of the map unit. Slopes are 30 to 50 percent. This component is on mountains. The parent material consists of residuum weathered from sandstone. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is low. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is high. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the R015XE001CA Clayey Hills 10-14" P.z. ecological site. Nonirrigated land capability classification is 6e. This soil does not meet hydric criteria.

Component: Quinto (40%)
The Quinto component makes up 40 percent of the map unit. Slopes are 30 to 50 percent. This component is on mountains. The parent material consists of sandstone conglomerate. Depth to a root restrictive layer, bedrock, lithic, is 10 to 20 inches. The natural drainage class is somewhat excessively drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the R015XE080CA Shallow Coarse Loamy 10-16 ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria.

Component: Vallecitos (7%)
Generated brief soil descriptions are created for major soil components. The Vallecitos soil is a minor component.

Component: Rock outcrop (5%)
Generated brief soil descriptions are created for major soil components. The Rock outcrop soil is a minor component.

Component: Millsholm (3%)
Generated brief soil descriptions are created for major soil components. The Millsholm soil is a minor component.

Soil Information

Map Unit 615ws (0.06%)

Map Unit Name:	Honker-Quinto complex, 30 to 50 percent slopes
Bedrock Depth - Min:	43cm
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.

Major components are printed below

Honker(45%)	
horizon H1(0cm to 18cm)	Sandy loam
horizon H2(18cm to 41cm)	Clay loam
horizon H2(18cm to 41cm)	Loam
horizon H2(18cm to 41cm)	Sandy clay loam
horizon H3(41cm to 91cm)	Gravelly clay
horizon H3(41cm to 91cm)	Gravelly clay loam
horizon H3(41cm to 91cm)	Gravelly sandy clay
horizon H4(91cm to 102cm)	Unweathered bedrock
Quinto(40%)	
horizon H1(0cm to 15cm)	Gravelly sandy loam
horizon H2(15cm to 43cm)	Gravelly sandy clay loam
horizon H3(43cm to 48cm)	Unweathered bedrock

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 615ws - Honker-Quinto complex, 30 to 50 percent slopes

Component: Honker (45%)
The Honker component makes up 45 percent of the map unit. Slopes are 30 to 50 percent. This component is on mountain slopes. The parent material consists of sandstone. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is high. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the R015XE001CA Clayey Hills 10-14" P.z. ecological site. Nonirrigated land capability classification is 6e. This soil does not meet hydric criteria.

Component: Quinto (40%)
The Quinto component makes up 40 percent of the map unit. Slopes are 30 to 50 percent. This component is on mountain slopes. The parent material consists of residuum weathered from sandstone. Depth to a root restrictive layer, bedrock, lithic, is 10 to 20 inches. The natural drainage class is somewhat excessively drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the R015XE080CA Shallow Coarse Loamy 10-16 ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria.

Component: Vallecitos (5%)
Generated brief soil descriptions are created for major components. The Vallecitos soil is a minor component.

Component: Rock outcrop (3%)
Generated brief soil descriptions are created for major components. The Rock outcrop soil is a minor component.

Component: Millsholm (2%)
Generated brief soil descriptions are created for major components. The Millsholm soil is a minor component.

Map Unit 620 (0.87%)

Map Unit Name:	Franciscan sandy loam, 50 to 70 percent slopes

Soil Information

Bedrock Depth - Min:	97cm
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	C - Soils in this group have moderately high runoff potential when thoroughly wet. Water transmission through the soil is somewhat restricted.

Major components are printed below

Franciscan(80%)

horizon H1(0cm to 25cm)	Sandy loam
horizon H2(25cm to 66cm)	Sandy clay loam
horizon H3(66cm to 97cm)	Gravelly sandy clay loam
horizon H4(97cm to 102cm)	Unweathered bedrock

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 620 - Franciscan sandy loam, 50 to 70 percent slopes, MLRA 15

Component: Franciscan (85%)
The Franciscan component makes up 85 percent of the map unit. Slopes are 50 to 70 percent. This component is on mountain slopes, mountains. The parent material consists of residuum weathered from metamorphic and sedimentary rock. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 3 percent. This component is in the F015XE078CA Unspecified ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Component: Gonzaga (6%)
Generated brief soil descriptions are created for major soil components. The Gonzaga soil is a minor component.

Component: Quinto (4%)
Generated brief soil descriptions are created for major soil components. The Quinto soil is a minor component.

Component: Rock outcrop (3%)
Generated brief soil descriptions are created for major soil components. The Rock outcrop soil is a minor component.

Component: Fifield (1%)
Generated brief soil descriptions are created for major soil components. The Fifield soil is a minor component.

Component: Ayar (1%)
Generated brief soil descriptions are created for major soil components. The Ayar soil is a minor component.

Map Unit 620ws (0.13%)

Map Unit Name:	Franciscan sandy loam, 50 to 70 percent slopes
Bedrock Depth - Min:	97cm
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	C - Soils in this group have moderately high runoff potential when thoroughly wet. Water transmission through the soil is somewhat restricted.

Major components are printed below

Franciscan(80%)

horizon H1(0cm to 25cm)	Sandy loam
horizon H2(25cm to 66cm)	Clay loam
horizon H2(25cm to 66cm)	Sandy clay loam
horizon H3(66cm to 97cm)	Gravelly clay loam
horizon H3(66cm to 97cm)	Gravelly sandy clay loam
horizon H4(97cm to 102cm)	Unweathered bedrock

Soil Information

Map Unit 625 (3.06%)

Map Unit Name:	Franciscan-Quinto-Honker complex, 50 to 75 percent slopes
Bedrock Depth - Min:	43cm
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.

Major components are printed below

Franciscan(40%)	
horizon H1(0cm to 25cm)	Sandy loam
horizon H2(25cm to 66cm)	Sandy clay loam
horizon H3(66cm to 97cm)	Gravelly sandy clay loam
horizon H4(97cm to 102cm)	Unweathered bedrock
Quinto(25%)	
horizon H1(0cm to 15cm)	Gravelly sandy loam
horizon H2(15cm to 43cm)	Gravelly sandy clay loam
horizon H3(43cm to 46cm)	Unweathered bedrock
Honker(20%)	
horizon H1(0cm to 18cm)	Sandy loam
horizon H2(18cm to 41cm)	Clay loam
horizon H3(41cm to 91cm)	Gravelly clay
horizon H4(91cm to 102cm)	Unweathered bedrock

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 625 - Franciscan-Quinto-Honker complex, 50 to 75 percent slopes, MLRA 15

Component: Franciscan (40%)
The Franciscan component makes up 40 percent of the map unit. Slopes are 50 to 75 percent. This component is on mountains, mountains. The parent material consists of residuum weathered from sandstone. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 3 percent. This component is in the F015XE078CA Unspecified ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria.

Component: Quinto (25%)
The Quinto component makes up 25 percent of the map unit. Slopes are 50 to 75 percent. This component is on mountains, mountains. The parent material consists of residuum weathered from sandstone. Depth to a root restrictive layer, bedrock, lithic, is 10 to 20 inches. The natural drainage class is somewhat excessively drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the R015XE080CA Shallow Coarse Loamy 10-16 ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria.

Component: Honker (20%)
The Honker component makes up 20 percent of the map unit. Slopes are 50 to 75 percent. This component is on mountains, mountains. The parent material consists of residuum weathered from sandstone. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the R015XE001CA Clayey Hills 10-14" P.z. ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria.

Component: Millsholm (7%)
Generated brief soil descriptions are created for major soil components. The Millsholm soil is a minor component.

Soil Information

Component: Gonzaga (3%)
Generated brief soil descriptions are created for major soil components. The Gonzaga soil is a minor component.

Component: Rock outcrop (3%)
Generated brief soil descriptions are created for major soil components. The Rock outcrop soil is a minor component.

Component: Fifield (2%)
Generated brief soil descriptions are created for major soil components. The Fifield soil is a minor component.

Map Unit 625ws (0.11%)

Map Unit Name:	Franciscan-Quinto-Honker complex, 50 to 75 percent slopes
Bedrock Depth - Min:	43cm
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.

Major components are printed below

Franciscan(40%)	
horizon H1(0cm to 25cm)	Sandy loam
horizon H2(25cm to 66cm)	Clay loam
horizon H2(25cm to 66cm)	Sandy clay loam
horizon H3(66cm to 97cm)	Gravelly clay loam
horizon H3(66cm to 97cm)	Gravelly sandy clay loam
horizon H4(97cm to 102cm)	Unweathered bedrock
Quinto(25%)	
horizon H1(0cm to 15cm)	Gravelly sandy loam
horizon H2(15cm to 43cm)	Gravelly sandy clay loam
horizon H3(43cm to 46cm)	Unweathered bedrock
Honker(20%)	
horizon H1(0cm to 18cm)	Sandy loam
horizon H2(18cm to 41cm)	Clay loam
horizon H2(18cm to 41cm)	Loam
horizon H2(18cm to 41cm)	Sandy clay loam
horizon H3(41cm to 91cm)	Gravelly clay
horizon H3(41cm to 91cm)	Gravelly clay loam
horizon H3(41cm to 91cm)	Gravelly sandy clay
horizon H4(91cm to 102cm)	Unweathered bedrock

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 625ws - Franciscan-Quinto-Honker complex, 50 to 75 percent slopes, MLRA 15

Component: Franciscan (40%)
The Franciscan component makes up 40 percent of the map unit. Slopes are 50 to 75 percent. This component is on mountains, mountains. The parent material consists of residuum weathered from sandstone. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 3 percent. This component is in the F015XE078CA Unspecified ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria.

Component: Quinto (25%)
The Quinto component makes up 25 percent of the map unit. Slopes are 50 to 75 percent. This component is on mountains, mountains. The parent material consists of residuum weathered from sandstone. Depth to a root restrictive layer, bedrock, lithic, is 10 to 20 inches. The natural drainage class is somewhat excessively drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not

flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the R015XE080CA Shallow Coarse Loamy 10-16 ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria.

Component: Honker (20%)
The Honker component makes up 20 percent of the map unit. Slopes are 50 to 75 percent. This component is on mountains, mountains. The parent material consists of residuum weathered from sandstone. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the R015XE001CA Clayey Hills 10-14" P.z. ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria.

Component: Millsholm (7%)
Generated brief soil descriptions are created for major soil components. The Millsholm soil is a minor component.

Component: Rock outcrop (3%)
Generated brief soil descriptions are created for major soil components. The Rock outcrop soil is a minor component.

Component: Gonzaga (3%)
Generated brief soil descriptions are created for major soil components. The Gonzaga soil is a minor component.

Component: Fifield (2%)
Generated brief soil descriptions are created for major soil components. The Fifield soil is a minor component.

Map Unit 630 (0.49%)

Map Unit Name:	Millsholm-Honker-Rock outcrop complex, 30 to 50 percent slopes
Bedrock Depth - Min:	0cm
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.
Major components are printed below	
Millsholm(45%)	
horizon H1(0cm to 48cm)	Loam
horizon H2(48cm to 58cm)	Unweathered bedrock
Rock outcrop(20%)	
horizon H1(0cm to 152cm)	Unweathered bedrock
Honker(20%)	
horizon H1(0cm to 18cm)	Sandy loam
horizon H2(18cm to 41cm)	Clay loam
horizon H3(41cm to 91cm)	Gravelly clay
horizon H4(91cm to 102cm)	Unweathered bedrock

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 630 - Millsholm-Honker-Rock outcrop complex, 15 to 50 percent slopes, MLRA 15

Component: Millsholm (45%)
The Millsholm component makes up 45 percent of the map unit. Slopes are 15 to 50 percent. This component is on mountain slopes on mountains. The parent material consists of residuum weathered from sandstone and shale. Depth to a root restrictive layer, bedrock, lithic, is 10 to 20 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the R015XE083CA Shallow Loamy Hills ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Soil Information

Component: Rock outcrop (20%)
Generated brief soil descriptions are created for major soil components. The Rock outcrop is a miscellaneous area.

Component: Honker (20%)
The Honker component makes up 20 percent of the map unit. Slopes are 15 to 50 percent. This component is on mountain slopes on mountains. The parent material consists of colluvium derived from sandstone and shale. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the R015XE001CA Clayey Hills 10-14" P.z. ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Component: Contra Costa (4%)
Generated brief soil descriptions are created for major soil components. The Contra Costa soil is a minor component.

Component: Honker (4%)
Generated brief soil descriptions are created for major soil components. The Honker soil is a minor component.

Component: Quinto (4%)
Generated brief soil descriptions are created for major soil components. The Quinto soil is a minor component.

Component: Millsholm (3%)
Generated brief soil descriptions are created for major soil components. The Millsholm soil is a minor component.

Map Unit 635 (0.92%)

Map Unit Name:	Millsholm loam, 50 to 65 percent slopes
Bedrock Depth - Min:	48cm
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.

Major components are printed below

Millsholm(85%)

horizon H1(0cm to 48cm)	Loam
horizon H2(48cm to 58cm)	Unweathered bedrock

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 635 - Millsholm loam, 25 to 55 percent slopes, dry, MLRA 15

Component: Millsholm (85%)
The Millsholm, dry component makes up 85 percent of the map unit. Slopes are 25 to 55 percent. This component is on mountain slopes on mountains. The parent material consists of residuum weathered from sandstone and shale. Depth to a root restrictive layer, bedrock, lithic, is 10 to 20 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the R015XE083CA Shallow Loamy Hills ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Component: Contra Costa (3%)
Generated brief soil descriptions are created for major soil components. The Contra Costa soil is a minor component.

Component: Rock outcrop (3%)
Generated brief soil descriptions are created for major soil components. The Rock outcrop soil is a minor component.

Component: Honker (3%)
Generated brief soil descriptions are created for major soil components. The Honker soil is a minor component.

Component: Quinto (3%)

Soil Information

Generated brief soil descriptions are created for major soil components. The Quinto soil is a minor component.

Component: Fifield (3%)
Generated brief soil descriptions are created for major soil components. The Fifield soil is a minor component.

Map Unit 635ws (0.03%)

Map Unit Name:	Millsholm loam, 50 to 65 percent slopes
Bedrock Depth - Min:	48cm
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.

Major components are printed below

Millsholm(85%)

horizon H1(0cm to 48cm)	Loam
horizon H2(48cm to 58cm)	Unweathered bedrock

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 635ws - Millsholm loam, 25 to 55 percent slopes, dry, MLRA 15

Component: Millsholm (85%)
The Millsholm, dry component makes up 85 percent of the map unit. Slopes are 25 to 55 percent. This component is on mountain slopes on mountains. The parent material consists of residuum weathered from sandstone and shale. Depth to a root restrictive layer, bedrock, lithic, is 10 to 20 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the R015XE083CA Shallow Loamy Hills ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Component: Quinto (3%)
Generated brief soil descriptions are created for major soil components. The Quinto soil is a minor component.

Component: Fifield (3%)
Generated brief soil descriptions are created for major soil components. The Fifield soil is a minor component.

Component: Contra Costa (3%)
Generated brief soil descriptions are created for major soil components. The Contra Costa soil is a minor component.

Component: Honker (3%)
Generated brief soil descriptions are created for major soil components. The Honker soil is a minor component.

Component: Rock outcrop (3%)
Generated brief soil descriptions are created for major soil components. The Rock outcrop soil is a minor component.

Map Unit 640 (1.63%)

Map Unit Name:	Quinto-Millsholm-Rock outcrop complex, 40 to 75 percent slopes
Bedrock Depth - Min:	0cm
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Somewhat excessively drained
Hydrologic Group - Dominant:	D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.

Major components are printed below

Quinto(35%)

horizon H1(0cm to 15cm)	Gravelly sandy loam
horizon H2(15cm to 43cm)	Gravelly sandy clay loam
horizon H3(43cm to 48cm)	Unweathered bedrock
Millsholm(30%)	
horizon H1(0cm to 48cm)	Loam
horizon H2(48cm to 58cm)	Unweathered bedrock
Rock outcrop(20%)	
horizon H1(0cm to 152cm)	Unweathered bedrock

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 640 - Quinto-Millsholm-Rock outcrop complex, 40 to 75 percent slopes

Component: Quinto (35%)
The Quinto component makes up 35 percent of the map unit. Slopes are 40 to 75 percent. This component is on mountains. The parent material consists of sandstone conglomerate. Depth to a root restrictive layer, bedrock, lithic, is 10 to 20 inches. The natural drainage class is somewhat excessively drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the R015XE080CA Shallow Coarse Loamy 10-16 ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria.

Component: Millsholm (30%)
The Millsholm component makes up 30 percent of the map unit. Slopes are 40 to 75 percent. This component is on mountains. The parent material consists of fractured sandstone and shale. Depth to a root restrictive layer, bedrock, lithic, is 10 to 20 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the R015XG009CA Shallow Loamy 5-8 ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria.

Component: Rock outcrop (20%)
Generated brief soil descriptions are created for major soil components. The Rock outcrop is a miscellaneous area.

Component: Vallecitos (5%)
Generated brief soil descriptions are created for major soil components. The Vallecitos soil is a minor component.

Component: Wisflat (5%)
Generated brief soil descriptions are created for major soil components. The Wisflat soil is a minor component.

Component: Honker (3%)
Generated brief soil descriptions are created for major soil components. The Honker soil is a minor component.

Component: Contra Costa (2%)
Generated brief soil descriptions are created for major soil components. The Contra Costa soil is a minor component.

Map Unit AkC (0.01%)

Map Unit Name:	Arbuckle loam, deep, 5 to 9 percent slopes
Bedrock Depth - Min:	null
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	B - Soils in this group have moderately low runoff potential when thoroughly wet. Water transmission through the soil is unimpeded.
Major components are printed below	
Arbuckle(85%)	
horizon H1(0cm to 51cm)	Loam
horizon H2(51cm to 102cm)	Gravelly loam

horizon H3(102cm to 127cm)	Very gravelly sandy loam

Component Description:

Minor map unit components are excluded from this report.

Map Unit: AkC - Arbuckle loam, deep, 5 to 9 percent slopes

Component: Arbuckle (85%)
The Arbuckle component makes up 85 percent of the map unit. Slopes are 5 to 9 percent. This component is on terraces. The parent material consists of alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 3e. Irrigated land capability classification is 2e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Component: Hillgate (4%)
Generated brief soil descriptions are created for major components. The Hillgate soil is a minor component.

Map Unit CoB (0.29%)

Map Unit Name:	Cortina very gravelly loam, 0 to 5 percent slopes
Bedrock Depth - Min:	null
Watertable Depth - Annual Min:	183cm
Drainage Class - Dominant:	Somewhat excessively drained
Hydrologic Group - Dominant:	B - Soils in this group have moderately low runoff potential when thoroughly wet. Water transmission through the soil is unimpeded.

Major components are printed below

Cortina(85%)

horizon H1(0cm to 20cm)	Very gravelly loam
horizon H2(20cm to 152cm)	SR to very gravelly sandy loam to very gravelly loam

Component Description:

Minor map unit components are excluded from this report.

Map Unit: CoB - Cortina very gravelly loam, 0 to 5 percent slopes, MLRA 15

Component: Cortina (85%)
The Cortina component makes up 85 percent of the map unit. Slopes are 0 to 5 percent. This component is on flood plains on valleys. The parent material consists of gravelly alluvium derived from metamorphic and sedimentary rock. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat excessively drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is occasionally flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 4w. Irrigated land capability classification is 4w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Component: Riverwash (8%)
Generated brief soil descriptions are created for major components. The Riverwash soil is a minor component.

Component: Garretson (7%)
Generated brief soil descriptions are created for major components. The Garretson soil is a minor component.

Map Unit GaA (0.04%)

Map Unit Name:	Garretson loam, gravel substratum, 0 to 2 percent slopes
Bedrock Depth - Min:	null
Watertable Depth - Annual Min:	null

Soil Information

Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	B - Soils in this group have moderately low runoff potential when thoroughly wet. Water transmission through the soil is unimpeded.

Major components are printed below

Garretson(85%)

horizon H1(0cm to 48cm)	Loam
horizon H2(48cm to 102cm)	Very fine sandy loam
horizon H3(102cm to 152cm)	Stratified sand

Component Description:

Minor map unit components are excluded from this report.

Map Unit: GaA - Garretson loam, gravel substratum, 0 to 2 percent slopes

Component: Garretson (85%)
The Garretson component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on alluvial fans, stream terraces. The parent material consists of alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 3c. Irrigated land capability classification is 1 This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Component: Garretson (85%)
The Garretson component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on alluvial fans, stream terraces. The parent material consists of alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 3c. Irrigated land capability classification is 1 This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Component: Cortina (5%)
Generated brief soil descriptions are created for major components. The Cortina soil is a minor component.

Component: Cortina (5%)
Generated brief soil descriptions are created for major components. The Cortina soil is a minor component.

Map Unit GbB (0.02%)

Map Unit Name:	Garretson gravelly loam, 0 to 5 percent slopes
Bedrock Depth - Min:	null
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	B - Soils in this group have moderately low runoff potential when thoroughly wet. Water transmission through the soil is unimpeded.

Major components are printed below

Garretson(85%)

horizon H1(0cm to 15cm)	Gravelly loam
horizon H2(15cm to 152cm)	Gravelly clay loam
horizon H2(15cm to 152cm)	Gravelly loam

Component Description:

Minor map unit components are excluded from this report.

Map Unit: GbB - Garretson gravelly loam, 0 to 5 percent slopes

Component: Garretson (85%)

Soil Information

The Garretson component makes up 85 percent of the map unit. Slopes are 0 to 5 percent. This component is on stream terraces, alluvial fans. The parent material consists of alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is high. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 3e. Irrigated land capability classification is 2e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Component: UNNAMED (2%)
Generated brief soil descriptions are created for major components. The UNNAMED soil is a minor component.

Map Unit GcD2 (0.13%)

Map Unit Name:	Gaviota loam, 5 to 15 percent slopes, eroded
Bedrock Depth - Min:	41cm
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.

Major components are printed below

Gaviota(85%)

horizon H1(0cm to 41cm)	Loam
horizon H2(41cm to 51cm)	Unweathered bedrock

Component Description:

Minor map unit components are excluded from this report.

Map Unit: GcD2 - Gaviota loam, 5 to 15 percent slopes, eroded

Component: Gaviota (85%)
The Gaviota component makes up 85 percent of the map unit. Slopes are 5 to 15 percent. This component is on mountain slopes. The parent material consists of residuum weathered from sandstone. Depth to a root restrictive layer, bedrock, lithic, is 10 to 20 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. This component is in the R015XD093CA Shallow Loamy ecological site. Nonirrigated land capability classification is 6e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Component: Vallecitos (4%)
Generated brief soil descriptions are created for major components. The Vallecitos soil is a minor component.

Component: Hillgate (3%)
Generated brief soil descriptions are created for major components. The Hillgate soil is a minor component.

Component: Pleasanton (3%)
Generated brief soil descriptions are created for major components. The Pleasanton soil is a minor component.

Map Unit GcE (0.24%)

Map Unit Name:	Gaviota loam, 15 to 30 percent slopes
Bedrock Depth - Min:	48cm
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.

Major components are printed below

Gaviota(85%)

horizon A1(0cm to 13cm)	Gravelly loam
horizon A2(13cm to 48cm)	Gravelly loam
horizon R(48cm to 58cm)	Bedrock

Component Description:

Minor map unit components are excluded from this report.

Map Unit: GcE - Gaviota loam, 15 to 30 percent slopes

Component: Gaviota (85%)
The Gaviota component makes up 85 percent of the map unit. Slopes are 15 to 30 percent. This component is on mountain slopes. The parent material consists of residuum weathered from shale and/or residuum weathered from sandstone. Depth to a root restrictive layer, bedrock, lithic, is 10 to 20 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. This component is in the R015XD093CA Shallow Loamy ecological site. Nonirrigated land capability classification is 6e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Component: Vallecitos (10%)
Generated brief soil descriptions are created for major components. The Vallecitos soil is a minor component.

Component: Rock outcrop (5%)
Generated brief soil descriptions are created for major components. The Rock outcrop soil is a minor component.

Map Unit GcG (11.9%)

Map Unit Name:	Gaviota loam, 30 to 75 percent slopes
Bedrock Depth - Min:	48cm
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.

Major components are printed below

Gaviota(88%)

horizon A1(0cm to 13cm)	Gravelly loam
horizon A2(13cm to 48cm)	Gravelly loam
horizon R(48cm to 58cm)	Bedrock

Component Description:

Minor map unit components are excluded from this report.

Map Unit: GcG - Gaviota loam, 30 to 75 percent slopes

Component: Gaviota (88%)
The Gaviota, loam component makes up 88 percent of the map unit. Slopes are 30 to 75 percent. This component is on mountain slopes. The parent material consists of residuum weathered from sandstone. Depth to a root restrictive layer, bedrock, lithic, is 10 to 20 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. This component is in the R015XD093CA Shallow Loamy ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Component: Vallecitos (10%)
Generated brief soil descriptions are created for major components. The Vallecitos soil is a minor component.

Component: Rock outcrop (2%)
Generated brief soil descriptions are created for major components. The Rock outcrop soil is a minor component.

Map Unit GhG2 (16.55%)

Map Unit Name:	Gaviota gravelly loam, 30 to 75 percent slopes, eroded, MLRA 15
Bedrock Depth - Min:	48cm
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.

Major components are printed below

Gaviota(80%)

horizon A1(0cm to 13cm)	Gravelly loam
horizon A2(13cm to 48cm)	Gravelly loam
horizon R(48cm to 73cm)	Bedrock

Component Description:

Minor map unit components are excluded from this report.

Map Unit: GhG2 - Gaviota gravelly loam, 30 to 75 percent slopes, eroded, MLRA 15

Component: Gaviota (80%)
The Gaviota component makes up 80 percent of the map unit. Slopes are 30 to 75 percent. This component is on mountain slopes, hills, mountains, ridges. The parent material consists of residuum weathered from shale and/or residuum weathered from sandstone. Depth to a root restrictive layer, bedrock, lithic, is 10 to 20 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. This component is in the R015XE077CA Shallow Gravelly Loam, Shallow Loamy, Shallow Loamy Hills 10-15" P.z. Gravelly ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Component: Vallecitos (10%)
Generated brief soil descriptions are created for major soil components. The Vallecitos soil is a minor component.

Component: Rock outcrop (5%)
Generated brief soil descriptions are created for major soil components. The Rock outcrop soil is a minor component.

Component: Honker (5%)
Generated brief soil descriptions are created for major soil components. The Honker soil is a minor component.

Map Unit GhG3 (2.69%)

Map Unit Name:	Gaviota gravelly loam, 30 to 75 percent slopes, severely eroded
Bedrock Depth - Min:	25cm
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.

Major components are printed below

Gaviota(85%)

horizon A(0cm to 25cm)	Gravelly loam
horizon R(25cm to 36cm)	Bedrock

Component Description:

Minor map unit components are excluded from this report.

Map Unit: GhG3 - Gaviota gravelly loam, 30 to 75 percent slopes, severely eroded

Soil Information

Component: Gaviota (85%)
The Gaviota, gravelly loam component makes up 85 percent of the map unit. Slopes are 30 to 75 percent. This component is on mountain slopes. The parent material consists of residuum weathered from sandstone. Depth to a root restrictive layer, bedrock, lithic, is 10 to 20 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. This component is in the R015XD092CA Shallow Gravelly Loam ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Component: Vallecitos (8%)
Generated brief soil descriptions are created for major soil components. The Vallecitos soil is a minor component.

Component: Rock outcrop (7%)
Generated brief soil descriptions are created for major soil components. The Rock outcrop soil is a minor component.

Map Unit GkE2 (0.1%)

Map Unit Name:	Gaviota rocky loam, 5 to 30 percent slopes, eroded
Bedrock Depth - Min:	48cm
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.

Major components are printed below

Gaviota(85%)

horizon H1(0cm to 48cm)	Gravelly loam
horizon H1(0cm to 48cm)	Loam
horizon H2(48cm to 58cm)	Unweathered bedrock

Component Description:

Minor map unit components are excluded from this report.

Map Unit: GkE2 - Gaviota rocky loam, 5 to 30 percent slopes, eroded

Component: Gaviota (85%)
The Gaviota component makes up 85 percent of the map unit. Slopes are 5 to 30 percent. This component is on mountain slopes. The parent material consists of residuum weathered from sandstone. Depth to a root restrictive layer, bedrock, lithic, is 10 to 20 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. This component is in the R015XD093CA Shallow Loamy ecological site. Nonirrigated land capability classification is 6e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Component: Rock outcrop (10%)
Generated brief soil descriptions are created for major components. The Rock outcrop soil is a minor component.

Component: Vallecitos (3%)
Generated brief soil descriptions are created for major components. The Vallecitos soil is a minor component.

Component: Esparto (2%)
Generated brief soil descriptions are created for major components. The Esparto soil is a minor component.

Map Unit HfC (0.18%)

Map Unit Name:	Hillgate silt loam, 2 to 9 percent slopes
Bedrock Depth - Min:	null
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Well drained

Soil Information

Hydrologic Group - Dominant:	D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.

Major components are printed below

Hillgate(85%)

horizon H1(0cm to 25cm)	Silt loam
horizon H2(25cm to 102cm)	Clay
horizon H2(25cm to 102cm)	Clay loam
horizon H3(102cm to 152cm)	Gravelly clay loam

Component Description:

Minor map unit components are excluded from this report.

Map Unit: HfC - Hillgate silt loam, 2 to 9 percent slopes

Component: Hillgate (85%)
The Hillgate component makes up 85 percent of the map unit. Slopes are 2 to 9 percent. This component is on terraces. The parent material consists of alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is low. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is high. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 3e. Irrigated land capability classification is 3e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Component: Pleasanton (3%)
Generated brief soil descriptions are created for major components. The Pleasanton soil is a minor component.

Component: San Ysidro (2%)
Generated brief soil descriptions are created for major components. The San Ysidro soil is a minor component.

Map Unit LhG (3.88%)

Map Unit Name:	Los Gatos-Gaviota complex, 50 to 75 percent slopes
Bedrock Depth - Min:	48cm
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	C - Soils in this group have moderately high runoff potential when thoroughly wet. Water transmission through the soil is somewhat restricted.

Major components are printed below

Los Gatos(60%)

horizon A1(0cm to 7cm)	Gravelly loam
horizon A2(7cm to 25cm)	Gravelly loam
horizon Bt1(25cm to 41cm)	Gravelly clay loam
horizon Bt2(41cm to 69cm)	Gravelly clay loam
horizon Bt3(69cm to 89cm)	Gravelly clay loam
horizon R(89cm to 99cm)	Bedrock

Gaviota(25%)

horizon A1(0cm to 13cm)	Gravelly loam
horizon A2(13cm to 48cm)	Gravelly loam
horizon R(48cm to 58cm)	Bedrock

Component Description:

Minor map unit components are excluded from this report.

Map Unit: LhG - Los Gatos-Gaviota complex, 50 to 75 percent slopes

Component: Los Gatos (60%)
The Los Gatos component makes up 60 percent of the map unit. Slopes are 50 to 75 percent. This component is on mountain slopes. The parent material consists of residuum weathered from shale and/or residuum weathered from sandstone. Depth to a root restrictive

layer, bedrock, lithic, is 25 to 50 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Component: Gaviota (25%)
The Gaviota component makes up 25 percent of the map unit. Slopes are 50 to 75 percent. This component is on mountain slopes. The parent material consists of residuum weathered from shale and/or residuum weathered from sandstone. Depth to a root restrictive layer, bedrock, lithic, is 10 to 20 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. This component is in the R015XD093CA Shallow Loamy ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Component: Altamont (4%)
Generated brief soil descriptions are created for major soil components. The Altamont soil is a minor component.

Component: Los Osos (4%)
Generated brief soil descriptions are created for major soil components. The Los Osos soil is a minor component.

Component: Rock outcrop (4%)
Generated brief soil descriptions are created for major soil components. The Rock outcrop soil is a minor component.

Component: Vallecitos (3%)
Generated brief soil descriptions are created for major soil components. The Vallecitos soil is a minor component.

Map Unit PfE (0.04%)

Map Unit Name:	Parrish gravelly clay loam, 9 to 30 percent slopes
Bedrock Depth - Min:	97cm
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	C - Soils in this group have moderately high runoff potential when thoroughly wet. Water transmission through the soil is somewhat restricted.

Major components are printed below

Parrish(85%)

horizon H1(0cm to 20cm)	Gravelly clay loam
horizon H2(20cm to 48cm)	Gravelly clay loam
horizon H3(48cm to 97cm)	Gravelly clay
horizon H3(48cm to 97cm)	Gravelly clay loam
horizon H4(97cm to 107cm)	Unweathered bedrock

Component Description:

Minor map unit components are excluded from this report.

Map Unit: PfE - Parrish gravelly clay loam, 9 to 30 percent slopes

Component: Parrish (85%)
The Parrish component makes up 85 percent of the map unit. Slopes are 9 to 30 percent. This component is on mountain slopes. The parent material consists of shale. Depth to a root restrictive layer, bedrock, lithic, is 24 to 42 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 4 percent. Nonirrigated land capability classification is 4e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Component: Los Gatos (3%)
Generated brief soil descriptions are created for major components. The Los Gatos soil is a minor component.

Component: Gaviota (2%)

Soil Information

Generated brief soil descriptions are created for major components. The Gaviota soil is a minor component.

Map Unit PpC (0.02%)

Map Unit Name:	Pleasanton gravelly loam, 2 to 9 percent slopes
Bedrock Depth - Min:	null
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	C - Soils in this group have moderately high runoff potential when thoroughly wet. Water transmission through the soil is somewhat restricted.

Major components are printed below

Pleasanton(85%)

horizon H1(0cm to 46cm)	Gravelly loam
horizon H2(46cm to 112cm)	Gravelly clay loam
horizon H3(112cm to 168cm)	Gravelly sandy clay loam

Component Description:

Minor map unit components are excluded from this report.

Map Unit: PpC - Pleasanton gravelly loam, 2 to 9 percent slopes

Component: Pleasanton (85%)
The Pleasanton component makes up 85 percent of the map unit. Slopes are 2 to 9 percent. This component is on terraces, alluvial fans. The parent material consists of alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 3e. Irrigated land capability classification is 2s. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Component: Cropley (3%)
Generated brief soil descriptions are created for major components. The Cropley soil is a minor component.

Component: Hillgate (3%)
Generated brief soil descriptions are created for major components. The Hillgate soil is a minor component.

Component: Garretson (3%)
Generated brief soil descriptions are created for major components. The Garretson soil is a minor component.

Map Unit PpD2 (0.09%)

Map Unit Name:	Pleasanton gravelly loam, 9 to 15 percent slopes, eroded
Bedrock Depth - Min:	null
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	C - Soils in this group have moderately high runoff potential when thoroughly wet. Water transmission through the soil is somewhat restricted.

Major components are printed below

Pleasanton(85%)

horizon H1(0cm to 46cm)	Gravelly loam
horizon H2(46cm to 112cm)	Gravelly clay loam
horizon H3(112cm to 168cm)	Gravelly sandy clay loam

Component Description:

Minor map unit components are excluded from this report.

Soil Information

Map Unit: PpD2 - Pleasanton gravelly loam, 9 to 15 percent slopes, eroded

Component: Pleasanton (85%)
The Pleasanton component makes up 85 percent of the map unit. Slopes are 9 to 15 percent. This component is on alluvial fans, terraces. The parent material consists of alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 3e. Irrigated land capability classification is 3e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Component: HILLGATE (3%)
Generated brief soil descriptions are created for major components. The HILLGATE soil is a minor component.

Map Unit Rg (0.88%)

Map Unit Name:	Riverwash
Bedrock Depth - Min:	null
Watertable Depth - Annual Min:	31cm
Drainage Class - Dominant:	null
Hydrologic Group - Dominant:	null

Major components are printed below

Riverwash(100%)

horizon H1(0cm to 15cm)	Sand
horizon H2(15cm to 152cm)	SR to coarse sand to sandy loam

Component Description:

Minor map unit components are excluded from this report.

Map Unit: Rg - Riverwash

Component: Riverwash (100%)
Generated brief soil descriptions are created for major soil components. The Riverwash is a miscellaneous area.

Map Unit RnG (0.29%)

Map Unit Name:	Rock land
Bedrock Depth - Min:	0cm
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	null
Hydrologic Group - Dominant:	null

Major components are printed below

Component Description:

Minor map unit components are excluded from this report.

Map Unit: RnG - Rock land

Component: Rock land (50%)
Generated brief soil descriptions are created for major soil components. The Rock land is a miscellaneous area.

Component: Lithic Xerorthents (40%)
The Lithic Xerorthents component makes up 40 percent of the map unit. Slopes are 50 to 75 percent. This component is on mountain slopes. The parent material consists of alluvium. Depth to a root restrictive layer, bedrock, lithic, is 8 to 20 inches. The natural drainage class is excessively drained. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Nonirrigated land

capability classification is 7e. This soil does not meet hydric criteria.

Component: GAVIOTA (4%)
Generated brief soil descriptions are created for major soil components. The GAVIOTA, LOAM soil is a minor component.

Component: Vallecitos (3%)
Generated brief soil descriptions are created for major soil components. The Vallecitos, rocky loam soil is a minor component.

Component: Montara (3%)
Generated brief soil descriptions are created for major soil components. The Montara, rocky cl soil is a minor component.

Map Unit VaE2 (23.42%)

Map Unit Name:	Vallecitos rocky loam, 15 to 30 percent slopes, eroded
Bedrock Depth - Min:	48cm
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.

Major components are printed below

Vallecitos(85%)

horizon A1(0cm to 5cm)	Loam
horizon A2(5cm to 25cm)	Loam
horizon Bt1(25cm to 41cm)	Clay
horizon Bt2(41cm to 48cm)	Clay
horizon R(48cm to 58cm)	Bedrock

Component Description:

Minor map unit components are excluded from this report.

Map Unit: VaE2 - Vallecitos rocky loam, 15 to 30 percent slopes, eroded

Component: Vallecitos (85%)
The Vallecitos component makes up 85 percent of the map unit. Slopes are 15 to 30 percent. This component is on mountains. The parent material consists of residuum weathered from shale. Depth to a root restrictive layer, bedrock, lithic, is 16 to 30 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is high. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the R015XD093CA Shallow Loamy ecological site. Nonirrigated land capability classification is 4e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Component: Rock outcrop (10%)
Generated brief soil descriptions are created for major soil components. The Rock outcrop soil is a minor component.

Component: Gaviota (3%)
Generated brief soil descriptions are created for major soil components. The Gaviota soil is a minor component.

Component: Montara (2%)
Generated brief soil descriptions are created for major soil components. The Montara soil is a minor component.

Map Unit VaG2 (15.46%)

Map Unit Name:	Vallecitos rocky loam, 50 to 75 percent slopes, eroded
Bedrock Depth - Min:	48cm
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.

Soil Information

Major components are printed below

Vallecitos(85%)

horizon H1(0cm to 25cm)	Loam
horizon H2(25cm to 48cm)	Clay
horizon H3(48cm to 58cm)	Unweathered bedrock

Component Description:

Minor map unit components are excluded from this report.

Map Unit: VaG2 - Vallecitos loam, 30 to 75 percent slopes, eroded, MLRA 15

Component: Vallecitos (80%)
The Vallecitos component makes up 80 percent of the map unit. Slopes are 30 to 75 percent. This component is on ridges on mountains, hillslopes on hills, mountain slopes on mountains. The parent material consists of residuum weathered from shale. Depth to a root restrictive layer, bedrock, lithic, is 12 to 24 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the R015XD130CA Shallow Loamy, Steep Shallow Loamy Uplands ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Component: Rock outcrop (10%)
Generated brief soil descriptions are created for major soil components. The Rock outcrop soil is a minor component.

Component: Los Osos (3%)
Generated brief soil descriptions are created for major soil components. The Los Osos soil is a minor component.

Component: Los Gatos (3%)
Generated brief soil descriptions are created for major soil components. The Los Gatos soil is a minor component.

Component: Henneke (3%)
Generated brief soil descriptions are created for major soil components. The Henneke soil is a minor component.

Component: Gaviota (1%)
Generated brief soil descriptions are created for major soil components. The Gaviota soil is a minor component.

Map Unit W (0.29%)

Map Unit Name:	WATER

No more attributes available for this map unit

Component Description:

Minor map unit components are excluded from this report.

Map Unit: W - WATER

Component: Water (100%)
Generated brief soil descriptions are created for major soil components. The Water is a miscellaneous area.

Map Unit YaB (0.01%)

Map Unit Name:	Yolo loam, 2 to 5 percent slopes
Bedrock Depth - Min:	null
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	C - Soils in this group have moderately high runoff potential when thoroughly wet. Water transmission through the soil is somewhat restricted.

Soil Information

Major components are printed below

Yolo(85%)

horizon H1(0cm to 74cm)	Loam
horizon H2(74cm to 152cm)	SR to loam to silty clay loam

Component Description:

Minor map unit components are excluded from this report.

Map Unit: YaB - Yolo loam, 0 to 8 percent slopes, MLRA 15

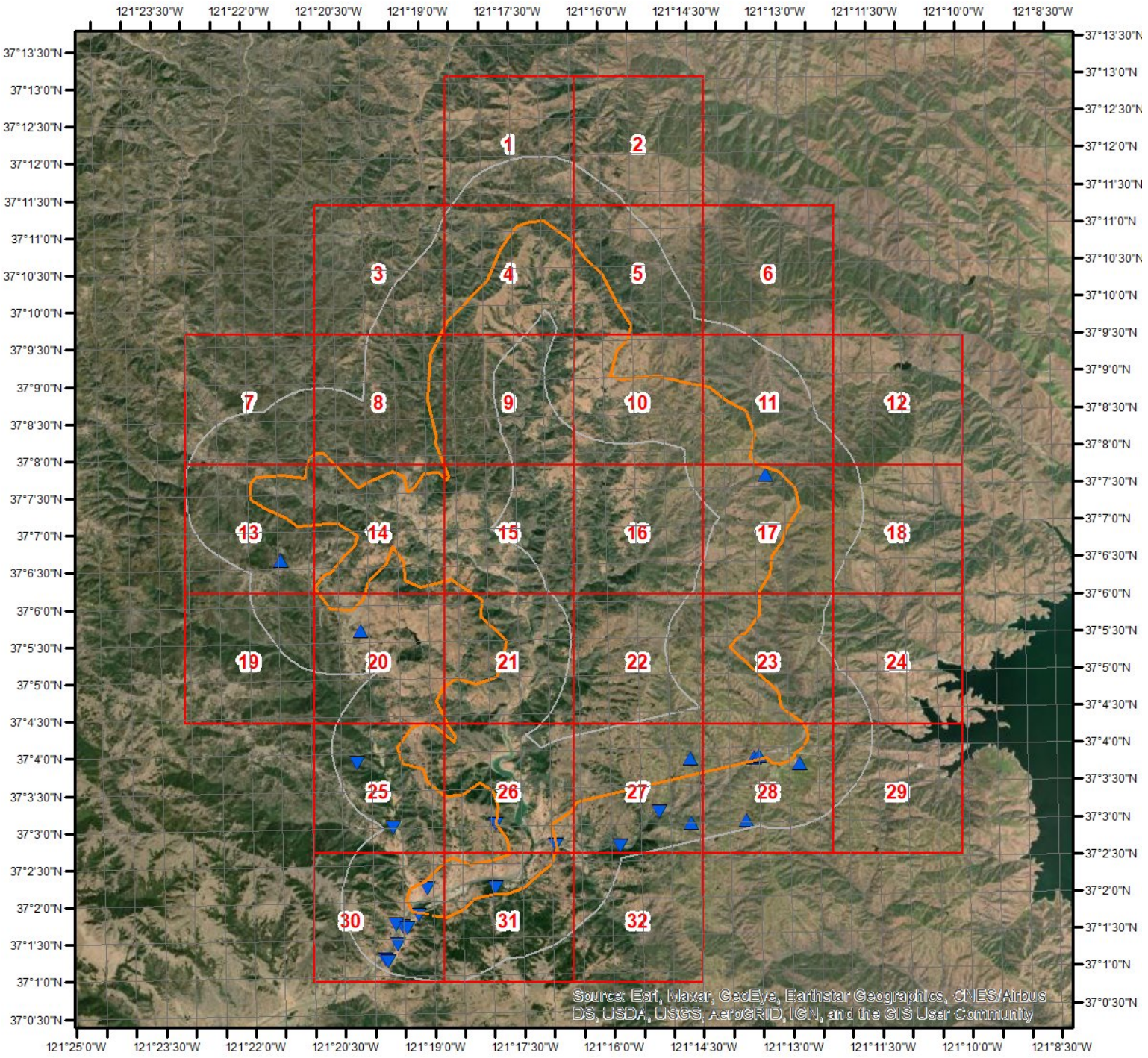
Component: Yolo (85%)
The Yolo component makes up 85 percent of the map unit. Slopes are 0 to 8 percent. This component is on high flood plains on valleys. The parent material consists of loamy alluvium derived from metamorphic and sedimentary rock. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is high. Shrink-swell potential is low. This soil is rarely flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 4e. Irrigated land capability classification is 2e. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 1 percent. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Unnamed (5%)
Generated brief soil descriptions are created for major soil components. The Unnamed soil is a minor component.

Component: Sycamore (5%)
Generated brief soil descriptions are created for major soil components. The Sycamore soil is a minor component.

Component: Livermore (5%)
Generated brief soil descriptions are created for major soil components. The Livermore soil is a minor component.

Wells and Additional Sources



Wells & Additional Sources

- Sites with Higher Elevation
- Sites with Same Elevation
- Sites with Lower Elevation
- Sites with Unknown Elevation

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0 1 2 4 Miles

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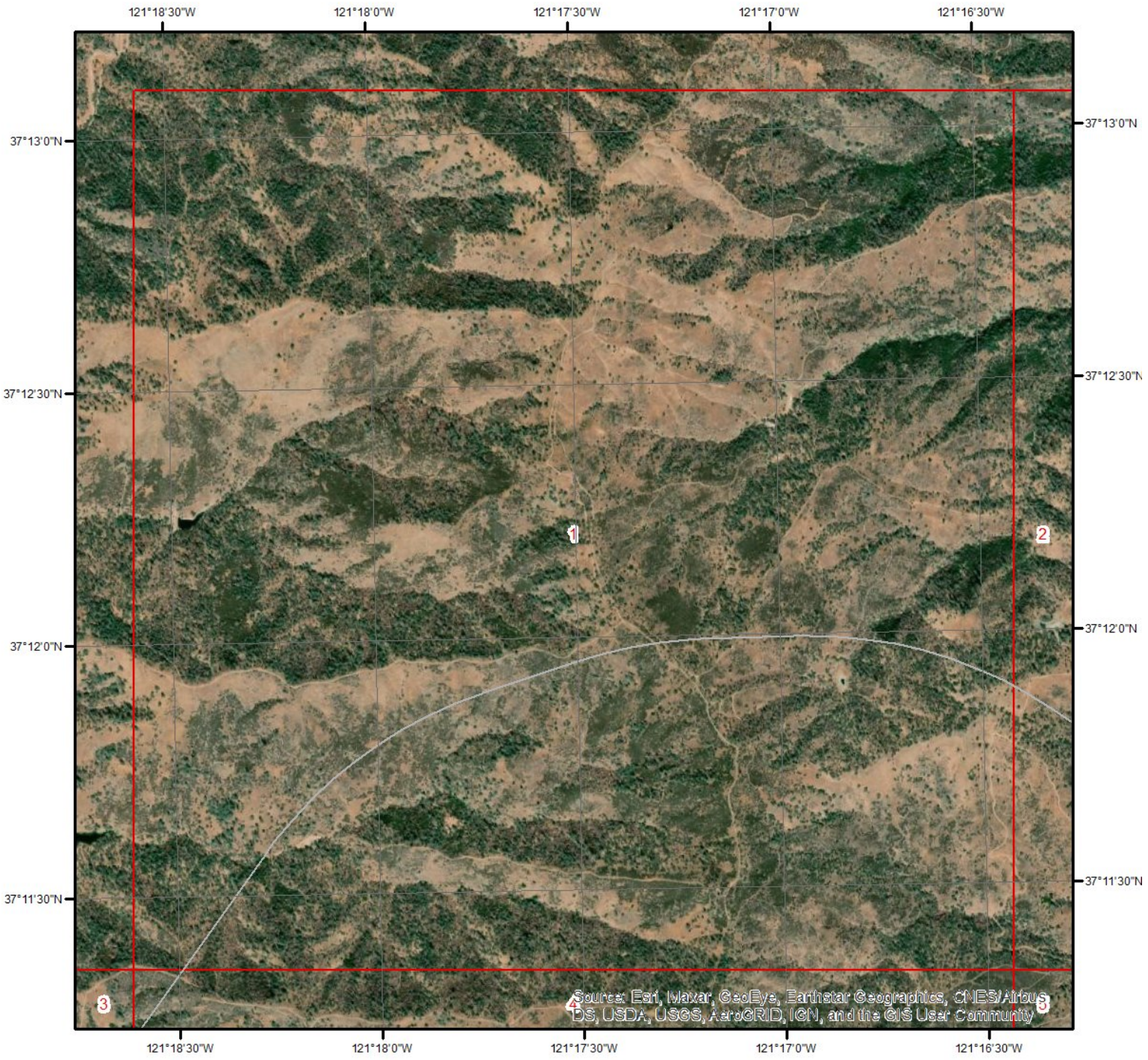
ENVIRONMENTAL RISK INFORMATION SERVICES

Wells and Additional Sources



Wells & Additional Sources - Page 1

- ▲ Sites with Higher Elevation
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- ▼ Sites with Lower Elevation
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Miles
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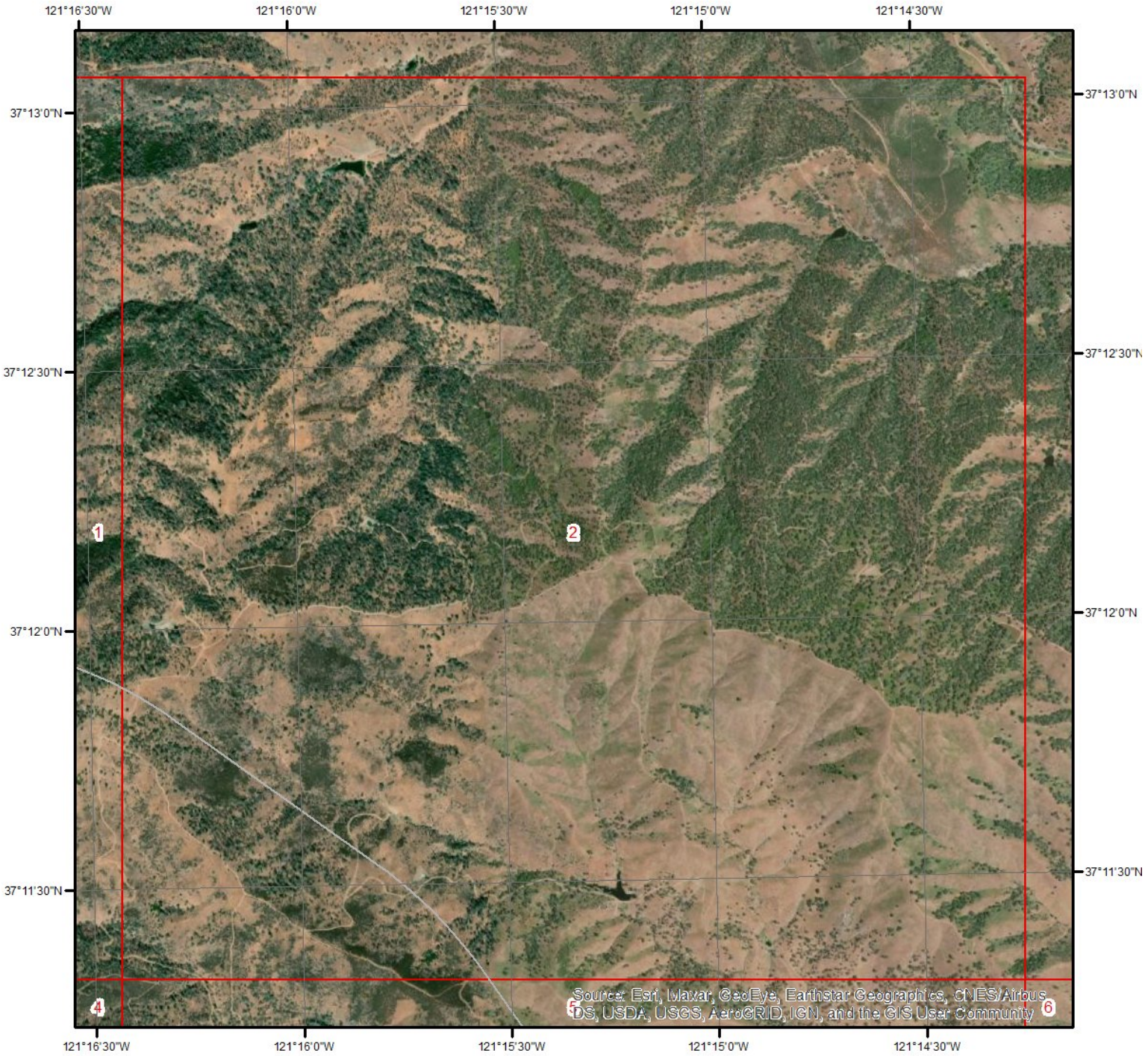
Wells and Additional Sources



Wells & Additional Sources - Page 2

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Miles
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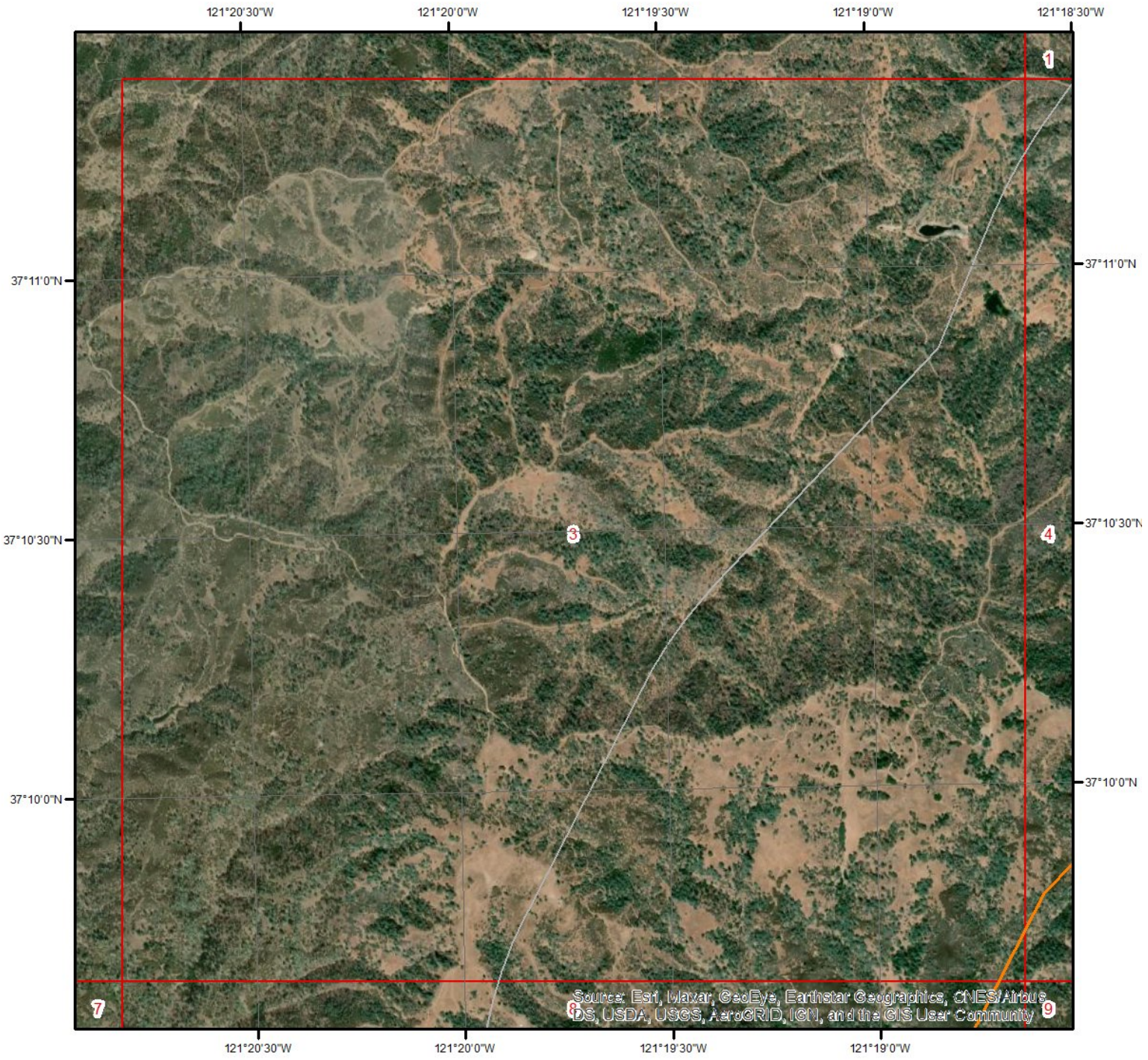
ENVIRONMENTAL RISK INFORMATION SERVICES

Wells and Additional Sources



Wells & Additional Sources - Page 3

- ▲ Sites with Higher Elevation
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Miles
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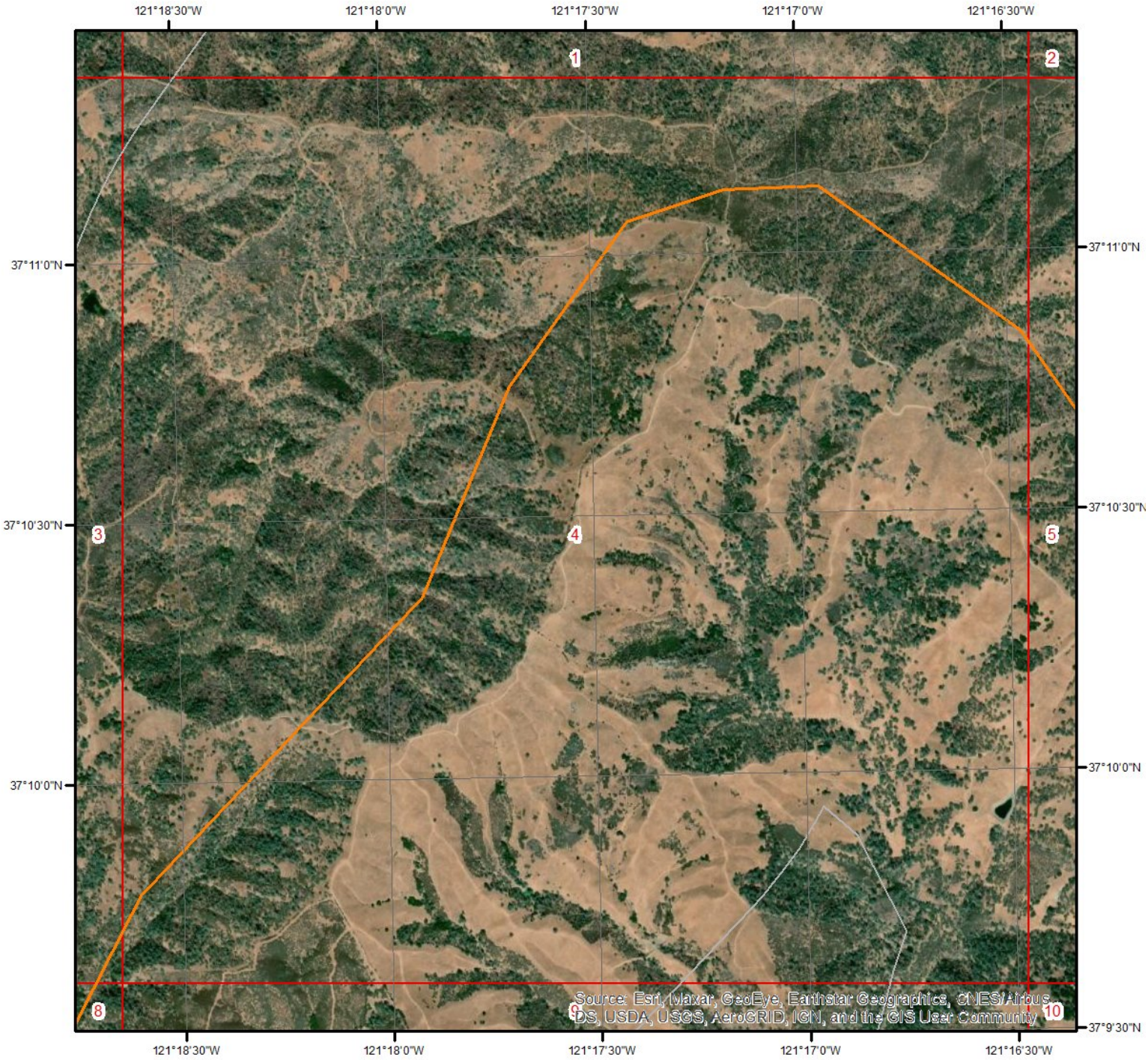
ENVIRONMENTAL RISK INFORMATION SERVICES

Wells and Additional Sources



Wells & Additional Sources - Page 4

- ▲ Sites with Higher Elevation
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Miles
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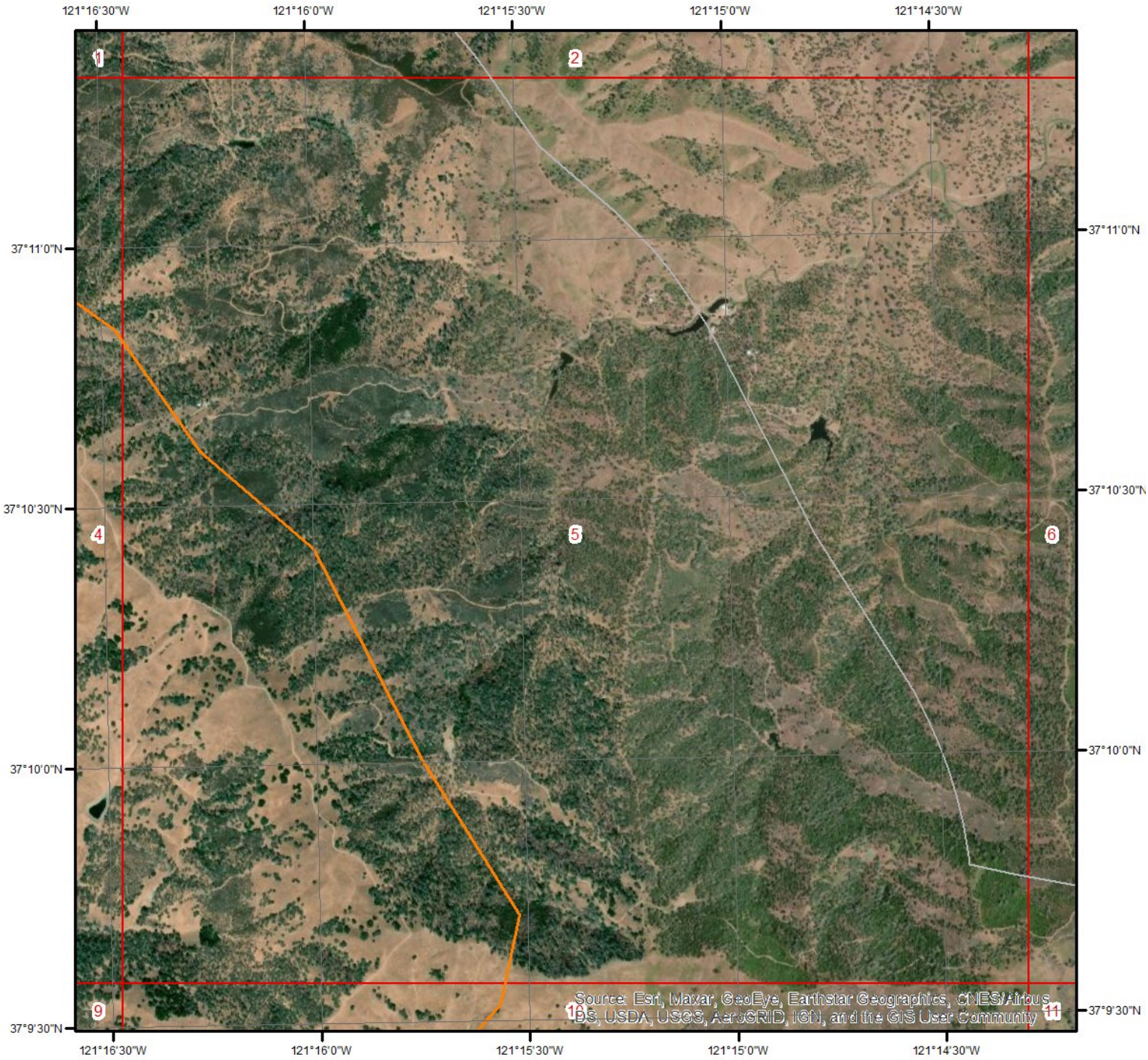
Wells and Additional Sources



Wells & Additional Sources - Page 5

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Miles
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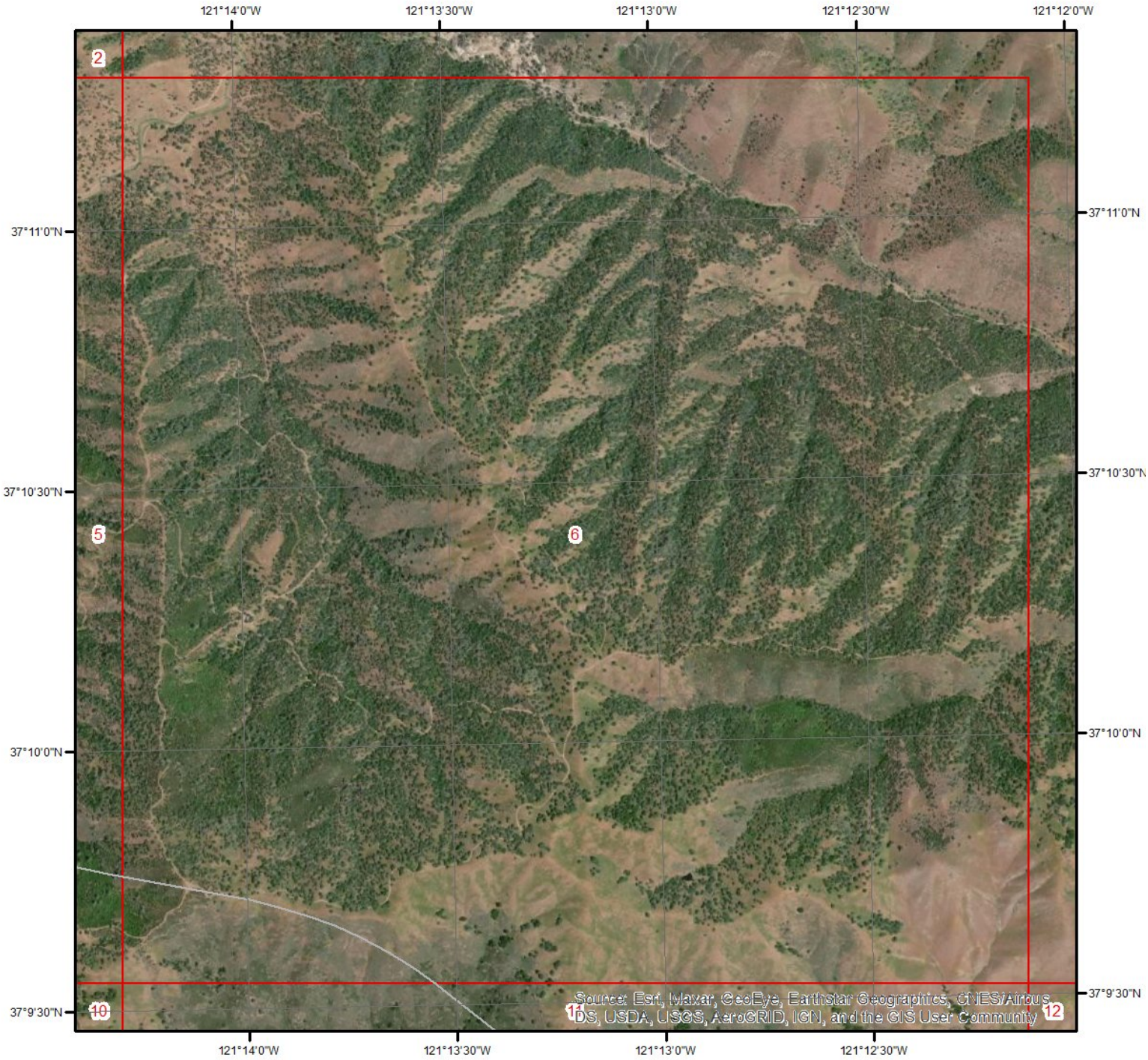
Wells and Additional Sources



Wells & Additional Sources - Page 6

- ▲ Sites with Higher Elevation
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- ▼ Sites with Lower Elevation
- ○ Sites with Unknown Elevation

Miles
0 0.15 0.3 0.6

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ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Wells and Additional Sources



Wells & Additional Sources - Page 7

- ▲ Sites with Higher Elevation
- ■ Sites with Same Elevation
- ▼ Sites with Lower Elevation
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Miles
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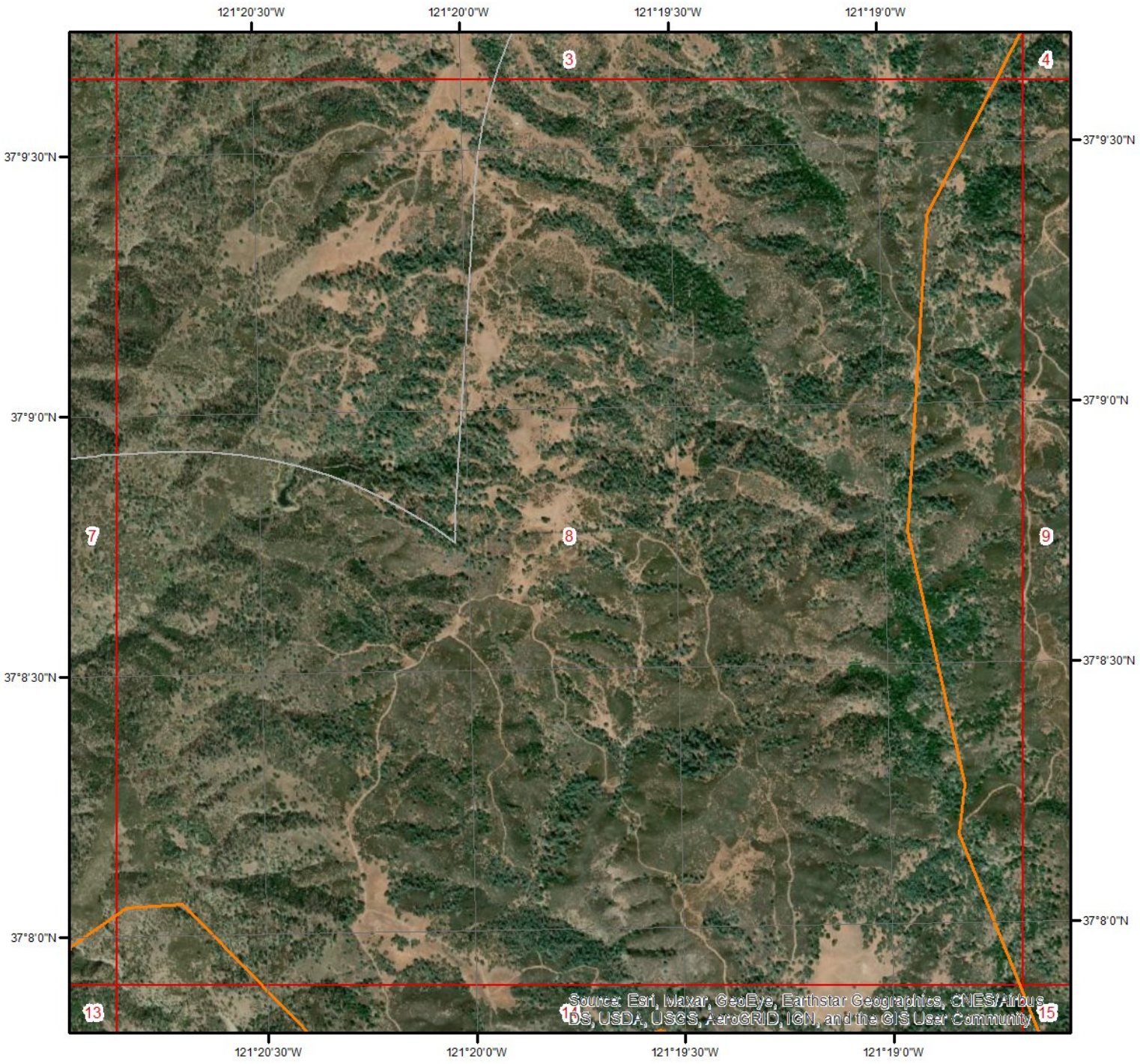
ENVIRONMENTAL RISK INFORMATION SERVICES

Wells and Additional Sources



Wells & Additional Sources - Page 8

- ▲ Sites with Higher Elevation
- ■ Sites with Same Elevation
- ▼ Sites with Lower Elevation
- ○ Sites with Unknown Elevation

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ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Wells and Additional Sources



Wells & Additional Sources - Page 9

- ▲ Sites with Higher Elevation
- ■ Sites with Same Elevation
- ▼ Sites with Lower Elevation
- ○ Sites with Unknown Elevation

Miles
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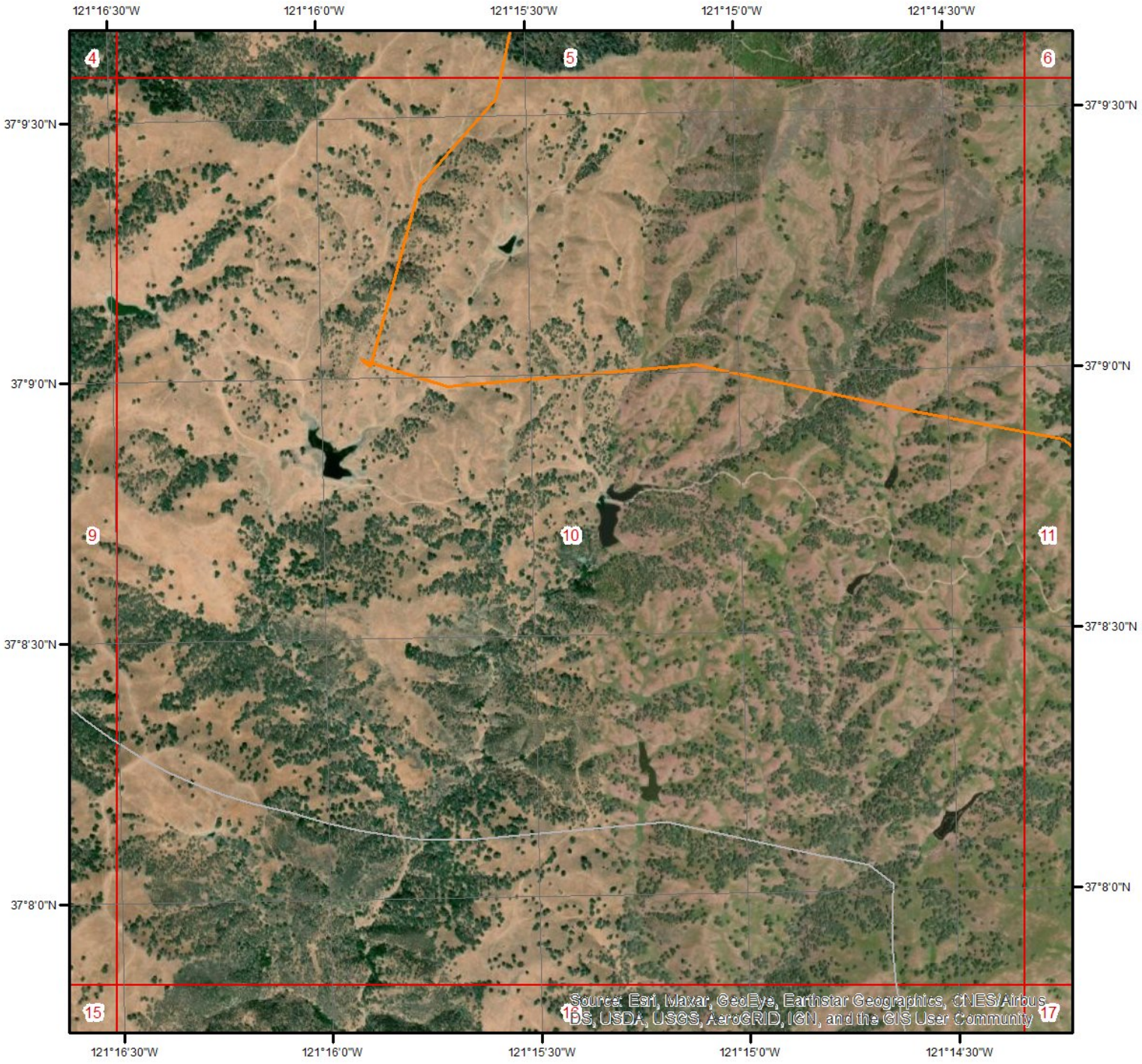
Wells and Additional Sources



Wells & Additional Sources - Page 10

- Sites with Higher Elevation
- Sites with Same Elevation
- Sites with Lower Elevation
- Sites with Unknown Elevation

Miles
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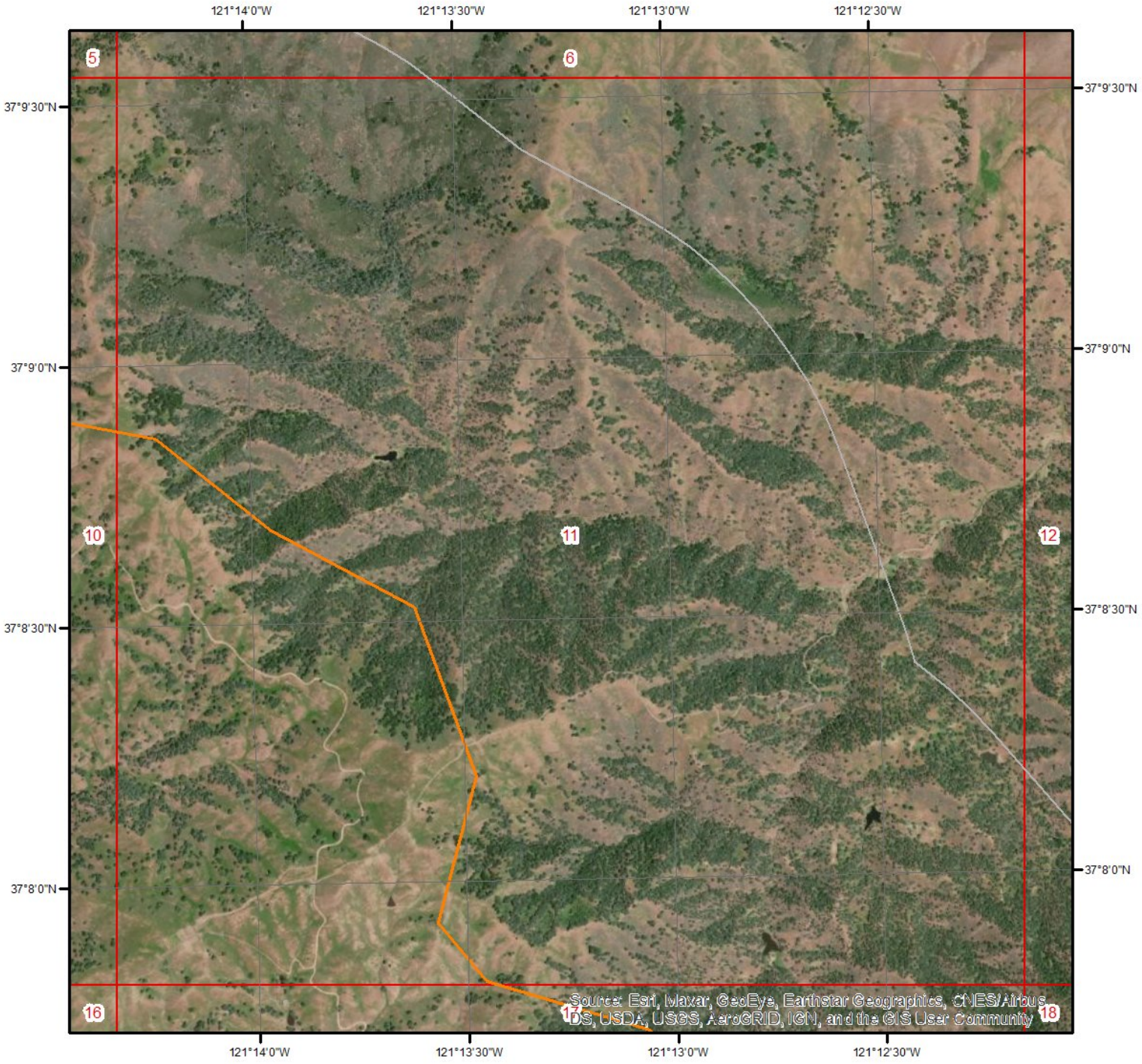
ENVIRONMENTAL RISK INFORMATION SERVICES

Wells and Additional Sources



Wells & Additional Sources - Page 11

- ▲ Sites with Higher Elevation
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Miles
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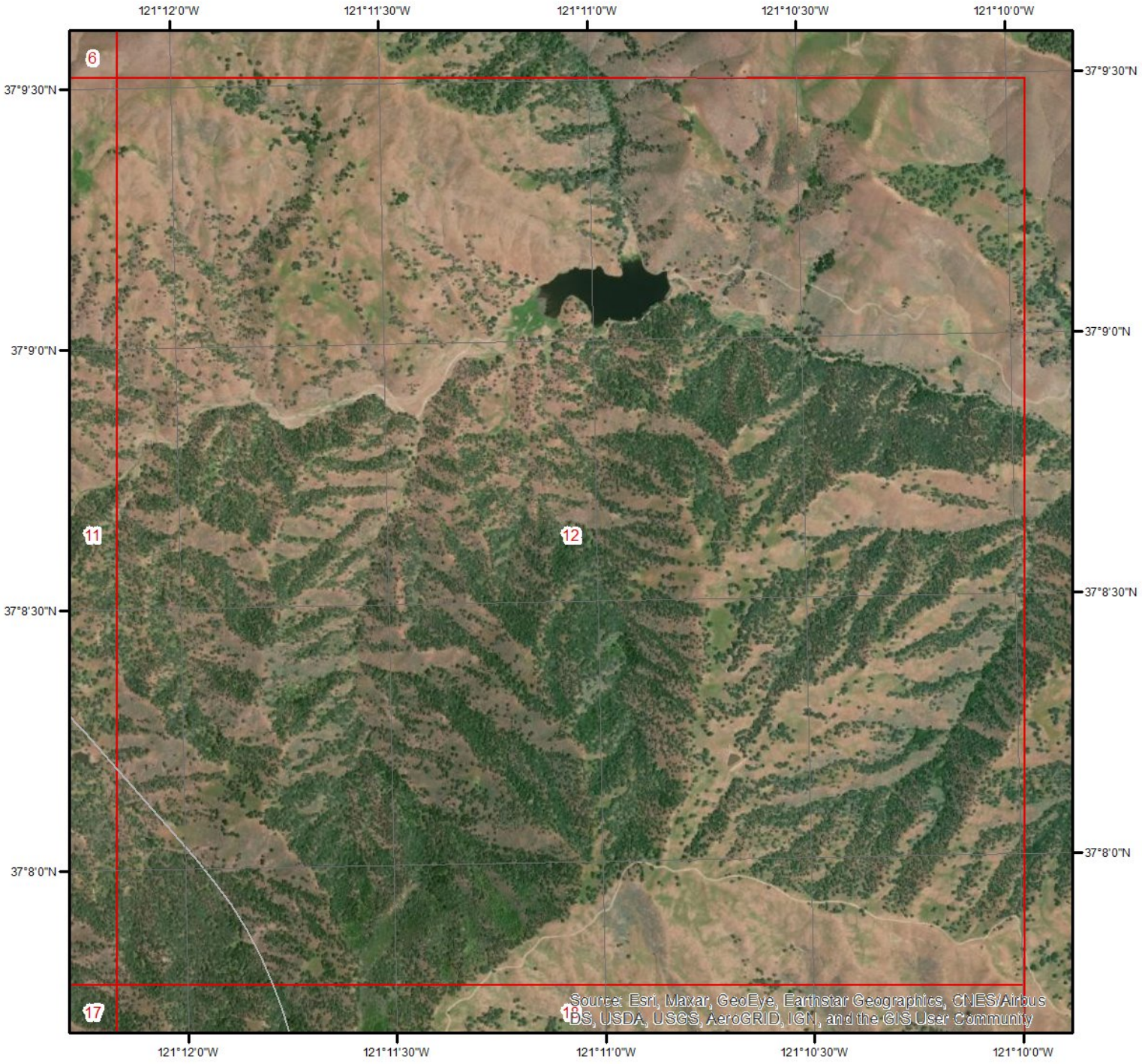
Wells and Additional Sources



Wells & Additional Sources - Page 12

- ▲ Sites with Higher Elevation
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Miles
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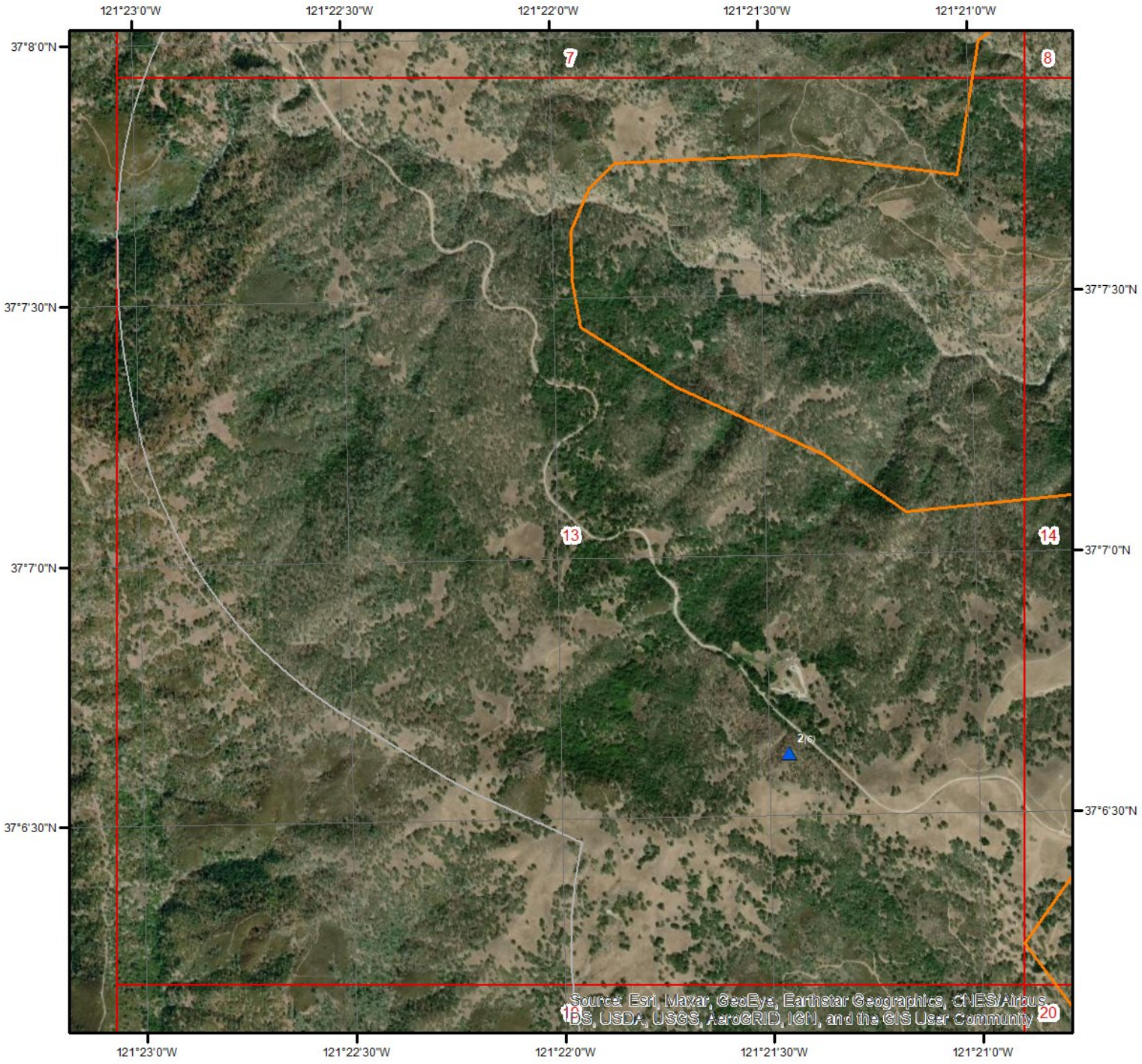

Wells & Additional Sources - Page 13

- ▲ Sites with Higher Elevation
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Miles

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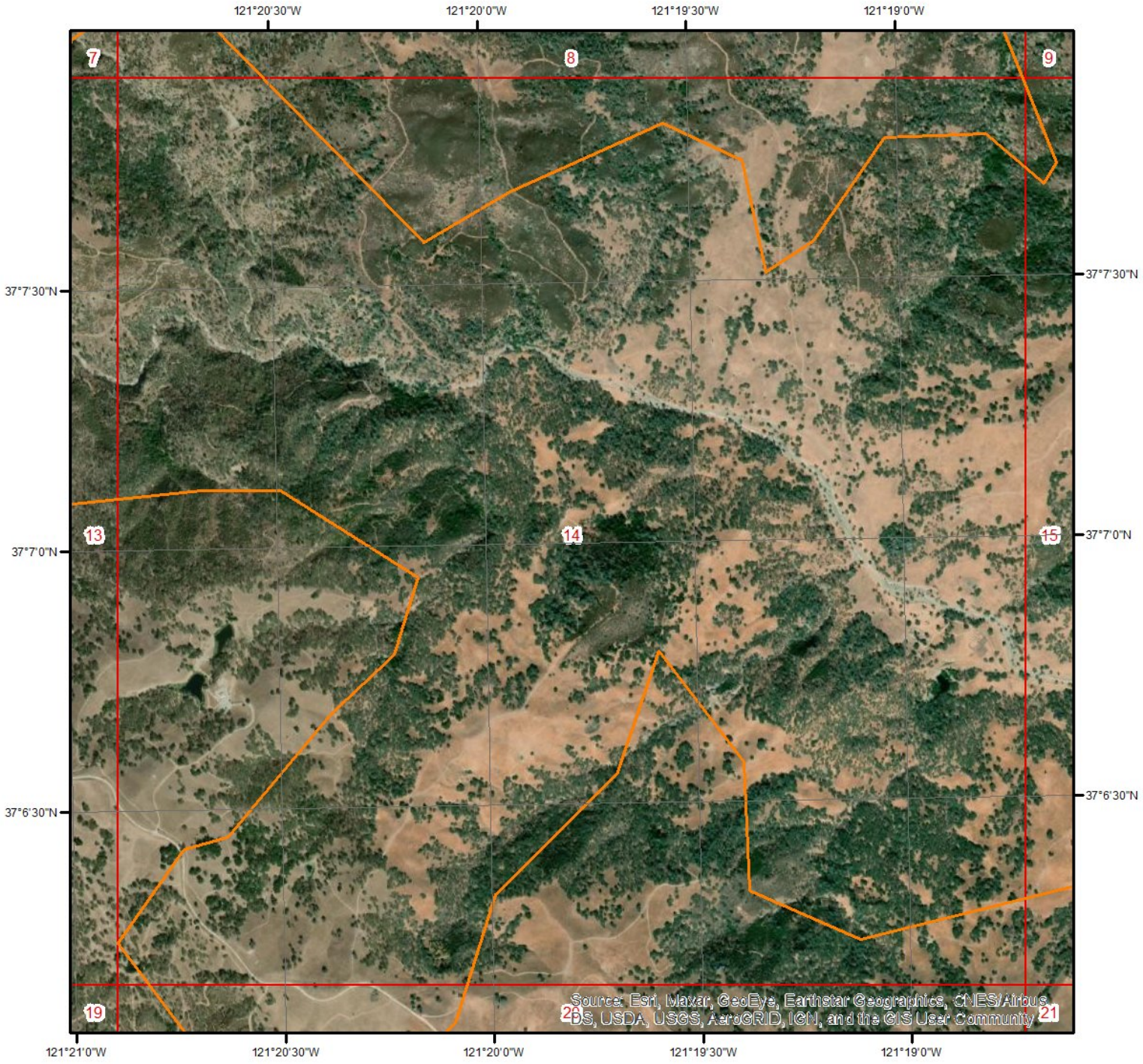

Wells & Additional Sources - Page 14

- ▲ Sites with Higher Elevation
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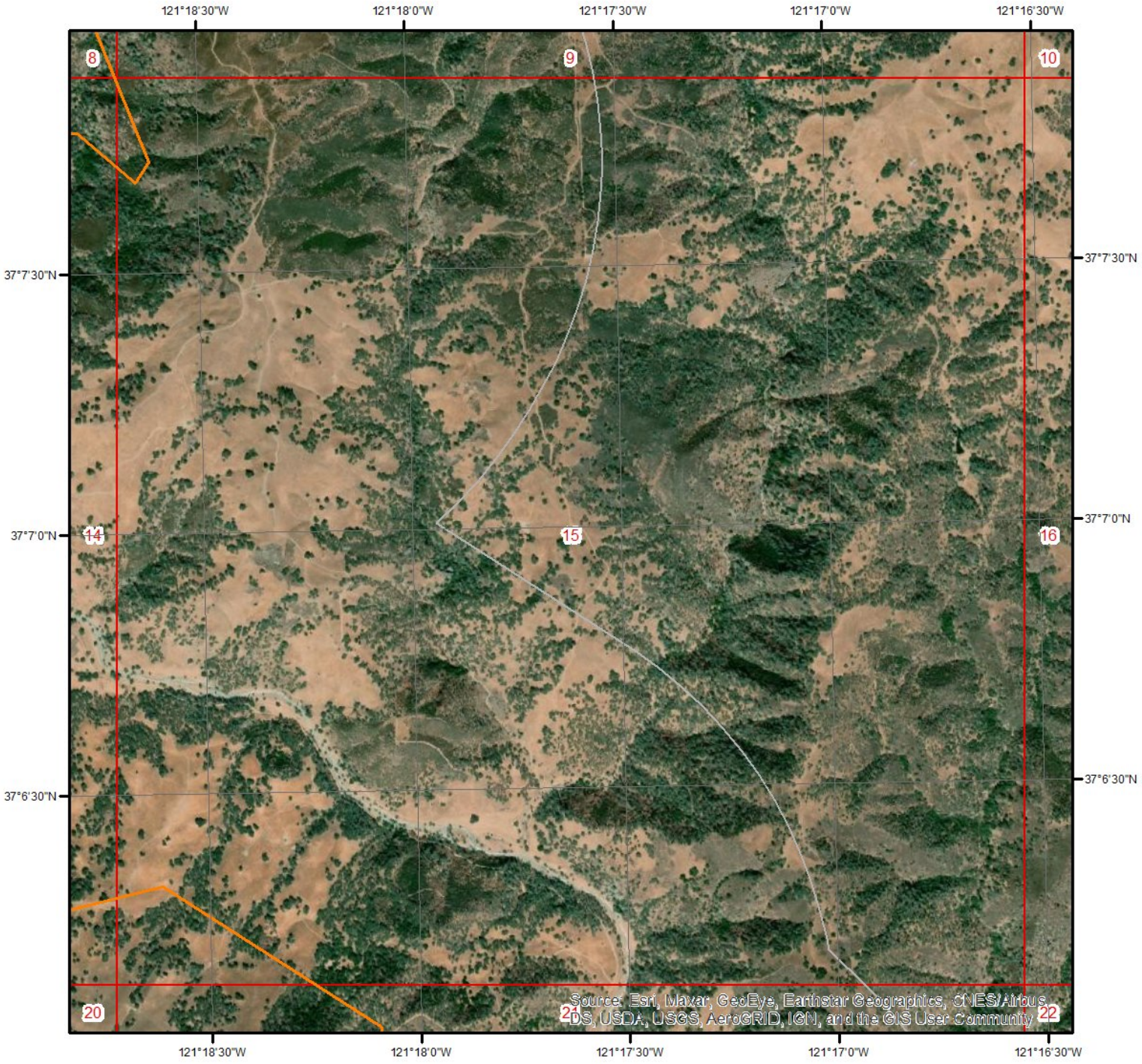

Wells & Additional Sources - Page 15

- Sites with Higher Elevation
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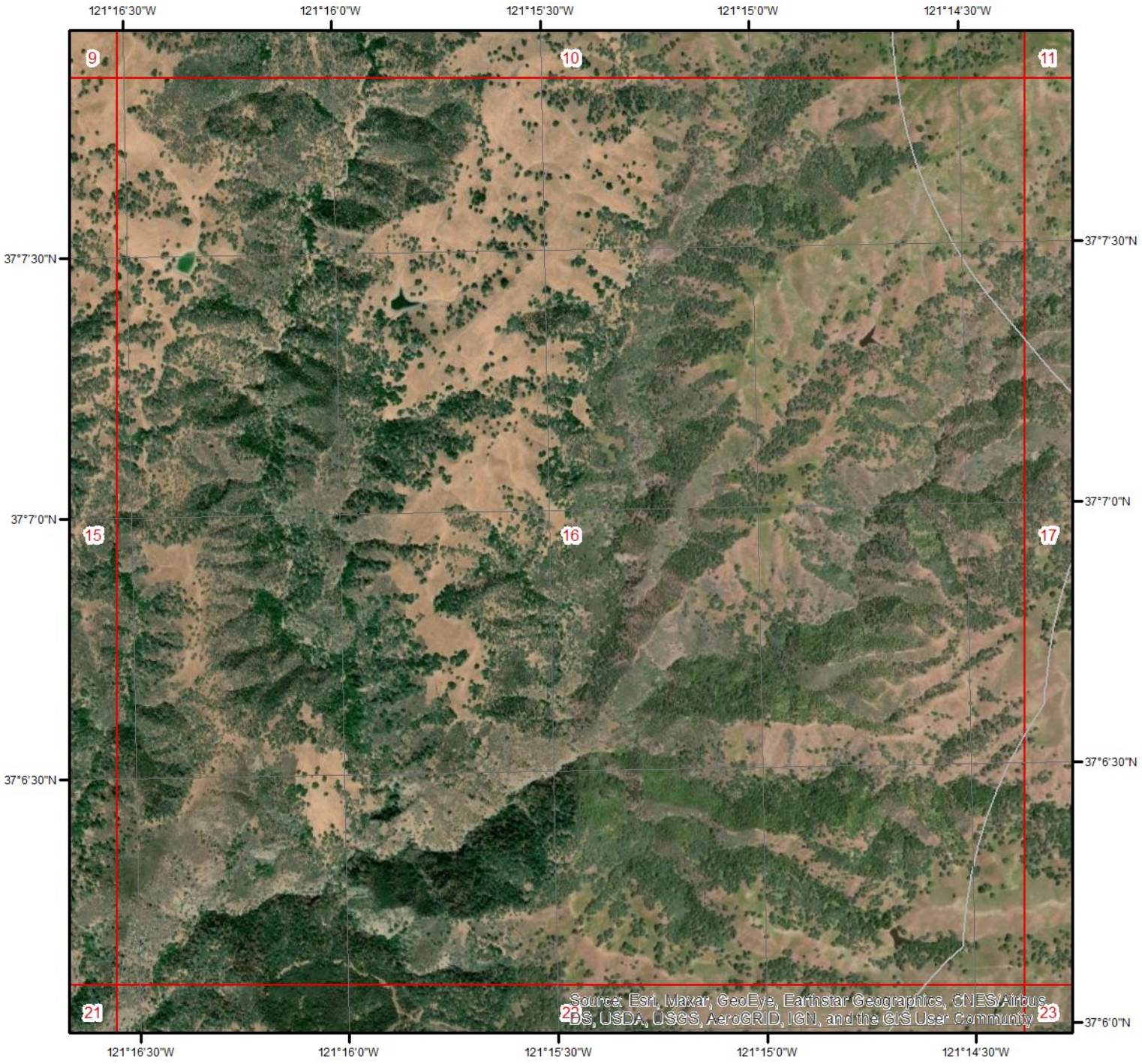

Wells & Additional Sources - Page 16

- ▲ Sites with Higher Elevation
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Miles
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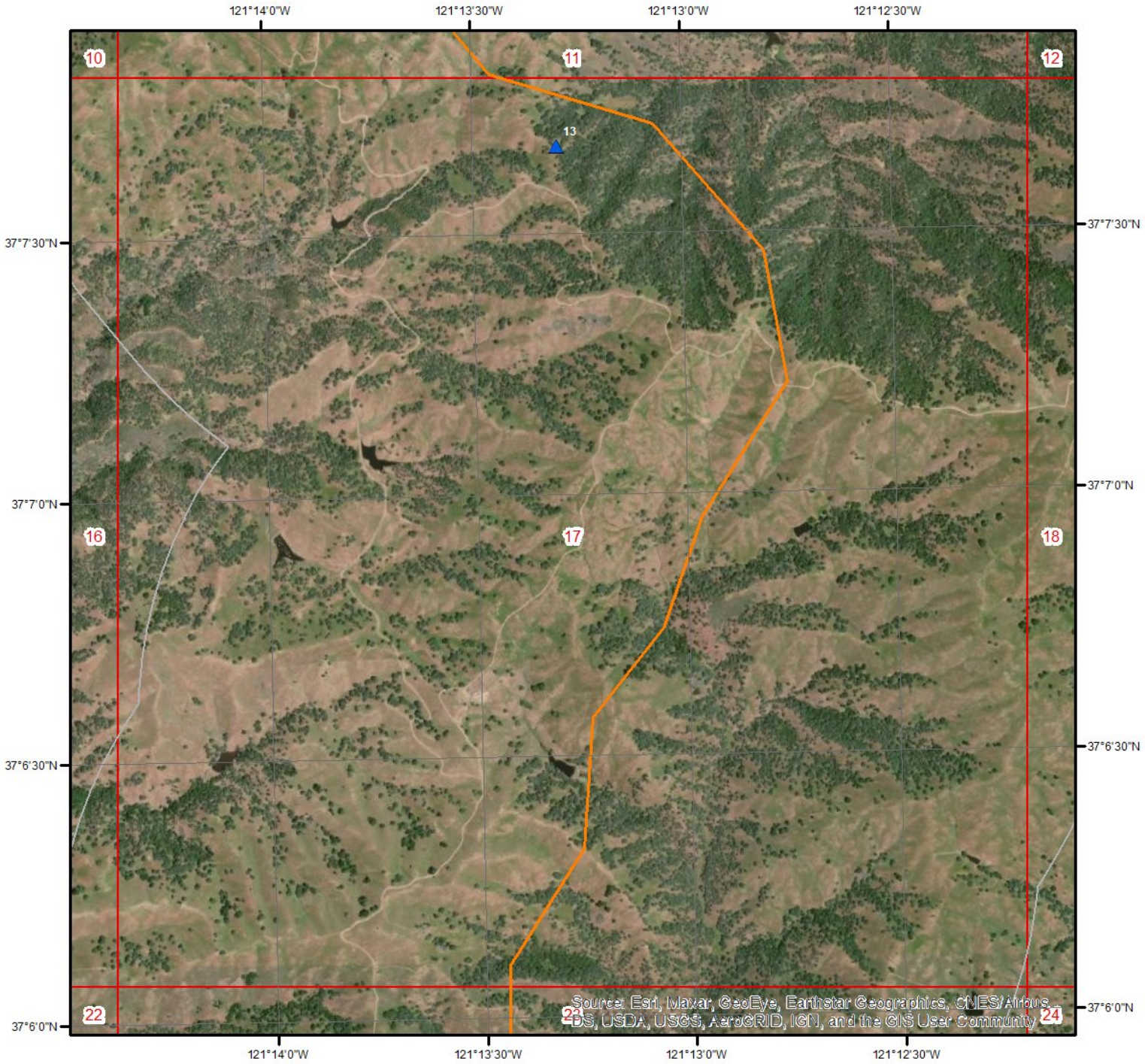
Wells and Additional Sources



Wells & Additional Sources - Page 17

- ▲ Sites with Higher Elevation
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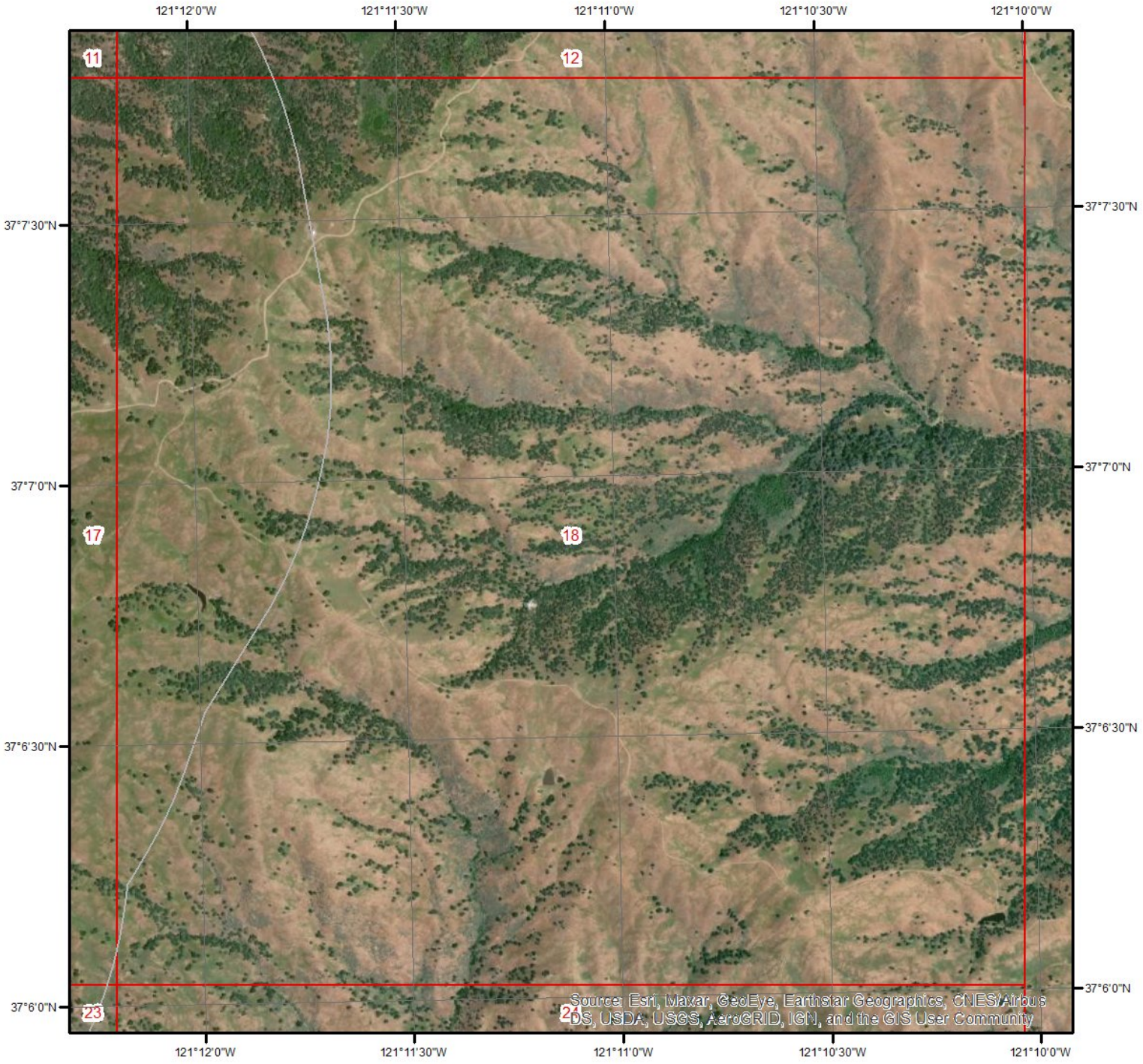
ENVIRONMENTAL RISK INFORMATION SERVICES

Wells and Additional Sources



Wells & Additional Sources - Page 18

- ▲ Sites with Higher Elevation
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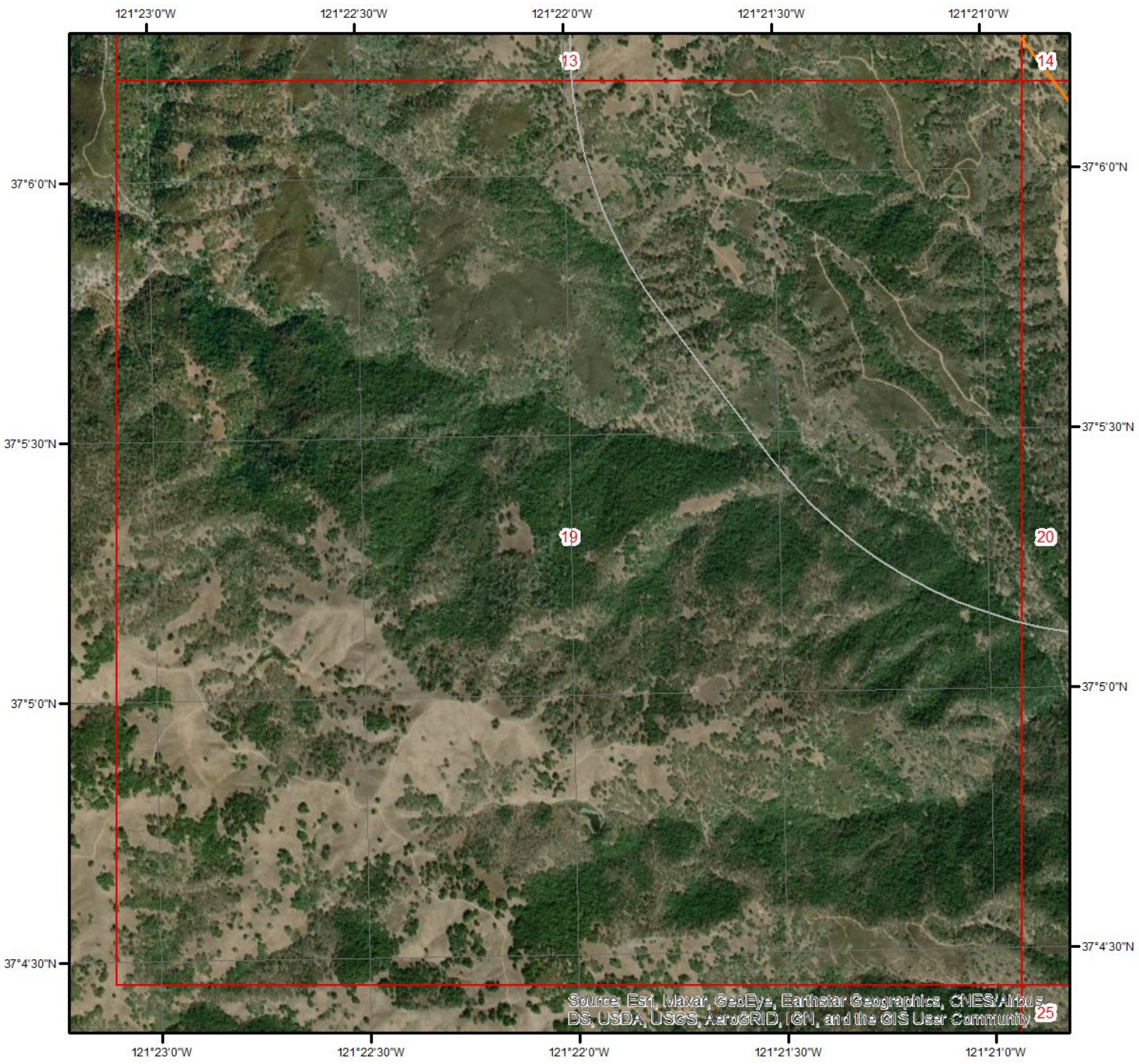
ENVIRONMENTAL RISK INFORMATION SERVICES

Wells and Additional Sources



Wells & Additional Sources - Page 19

- ▲ Sites with Higher Elevation
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Miles
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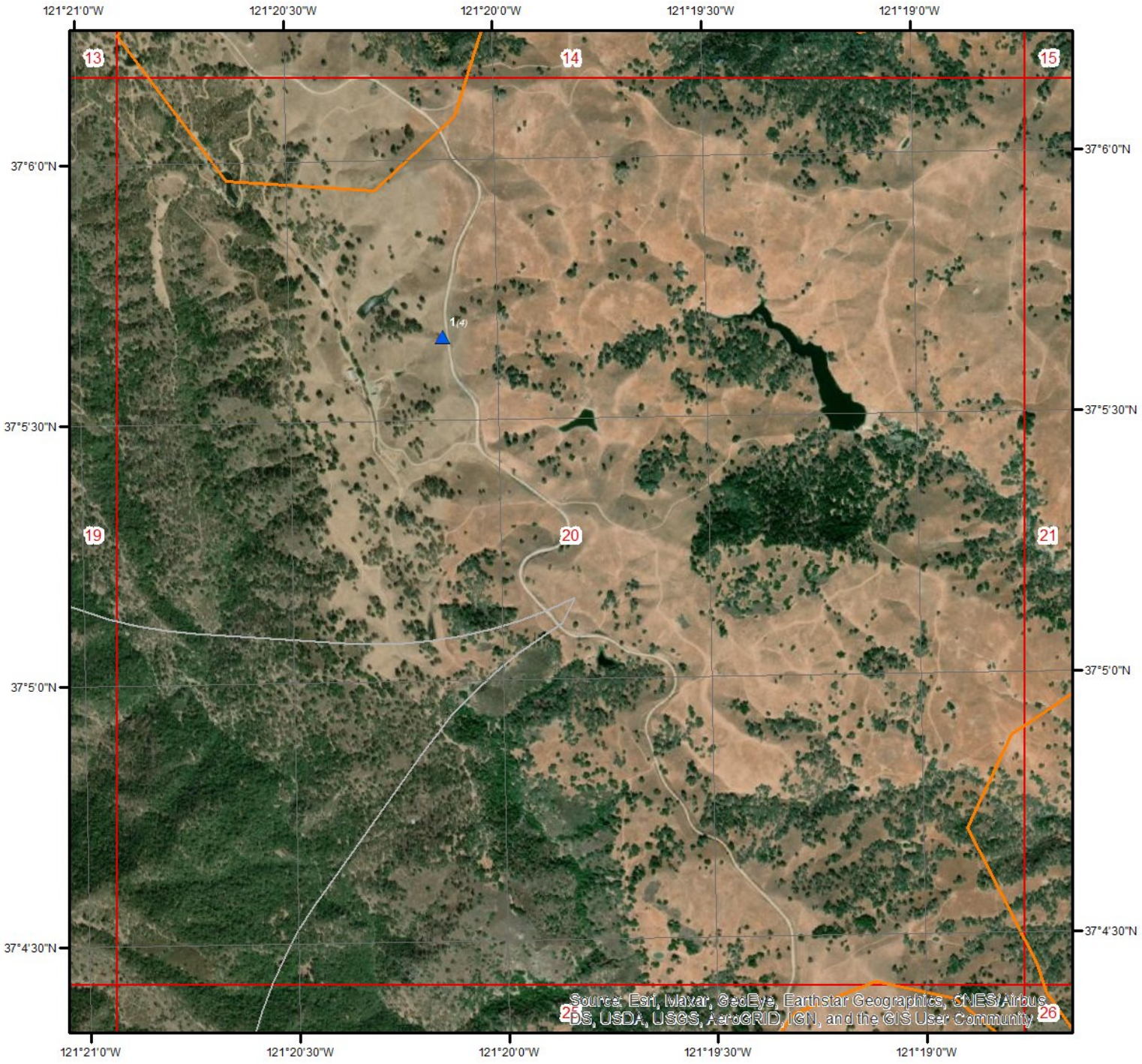
ENVIRONMENTAL RISK INFORMATION SERVICES

Wells and Additional Sources



Wells & Additional Sources - Page 20

- ▲ Sites with Higher Elevation
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Miles
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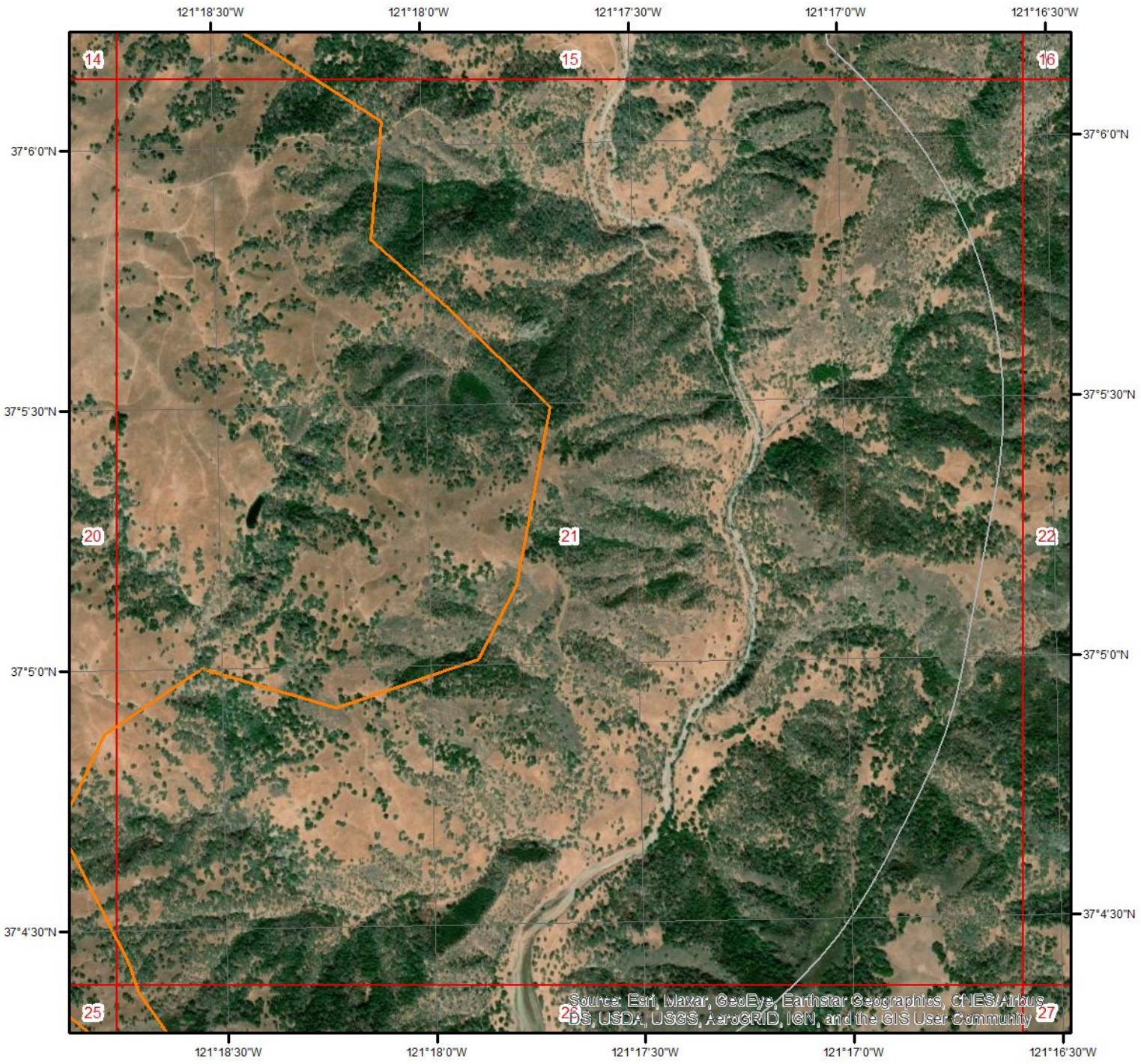
ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Wells and Additional Sources



Wells & Additional Sources - Page 21

- ▲ Sites with Higher Elevation
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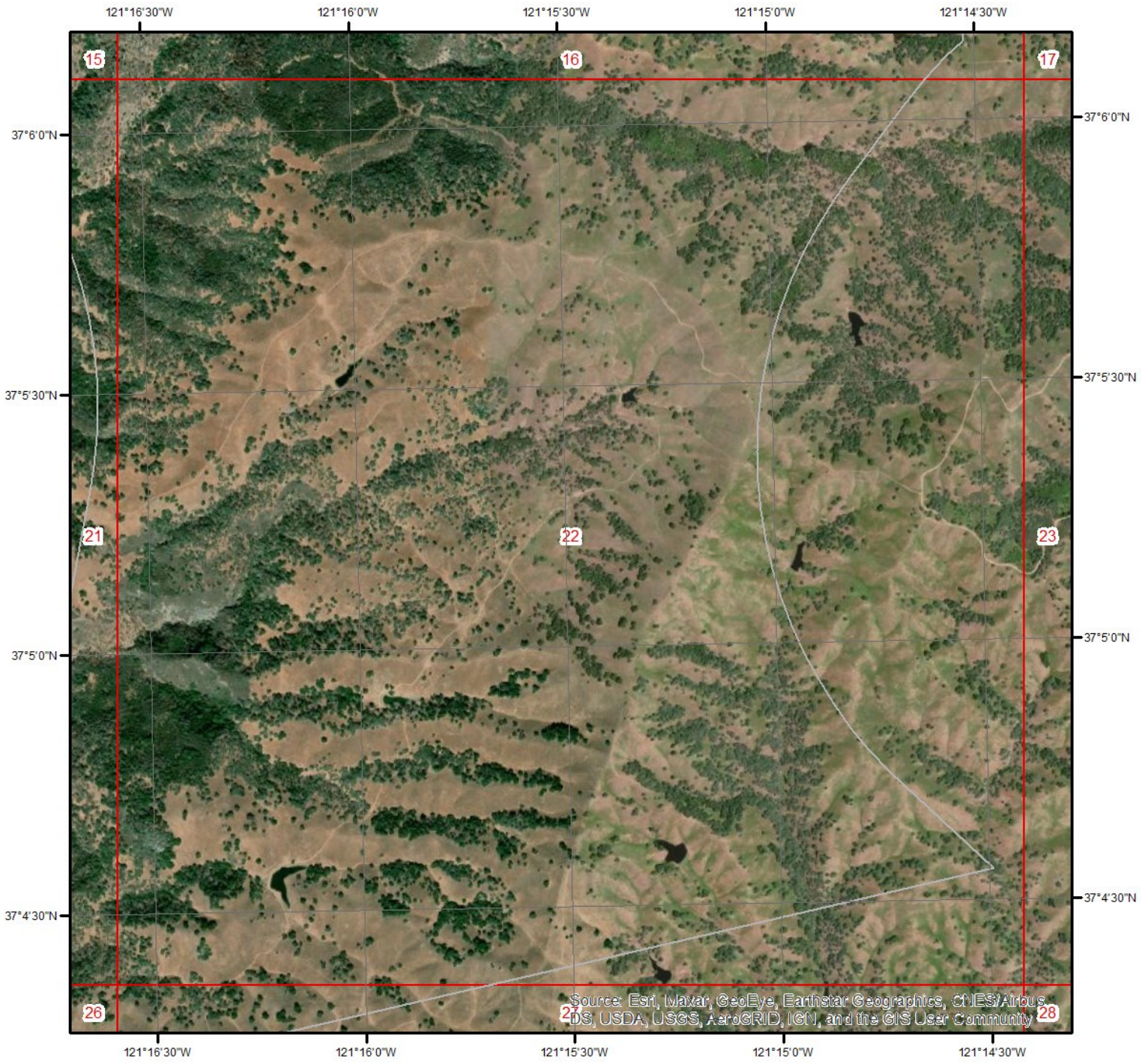
ENVIRONMENTAL RISK INFORMATION SERVICES

Wells and Additional Sources



Wells & Additional Sources - Page 22

- ▲ Sites with Higher Elevation
- ■ Sites with Same Elevation
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- ○ Sites with Unknown Elevation

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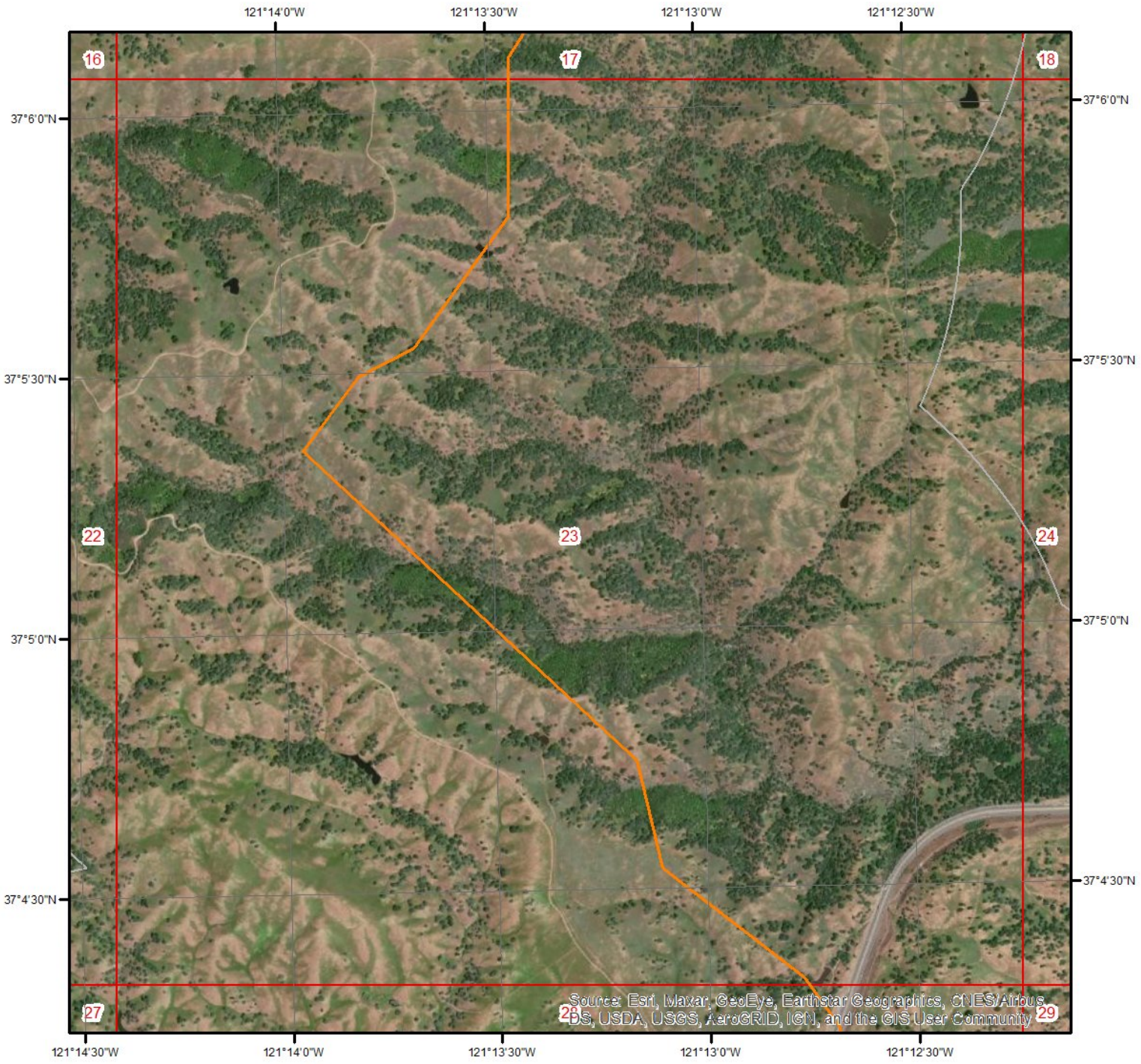
ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Wells and Additional Sources



Wells & Additional Sources - Page 23

- Sites with Higher Elevation
- Sites with Same Elevation
- Sites with Lower Elevation
- Sites with Unknown Elevation

Miles
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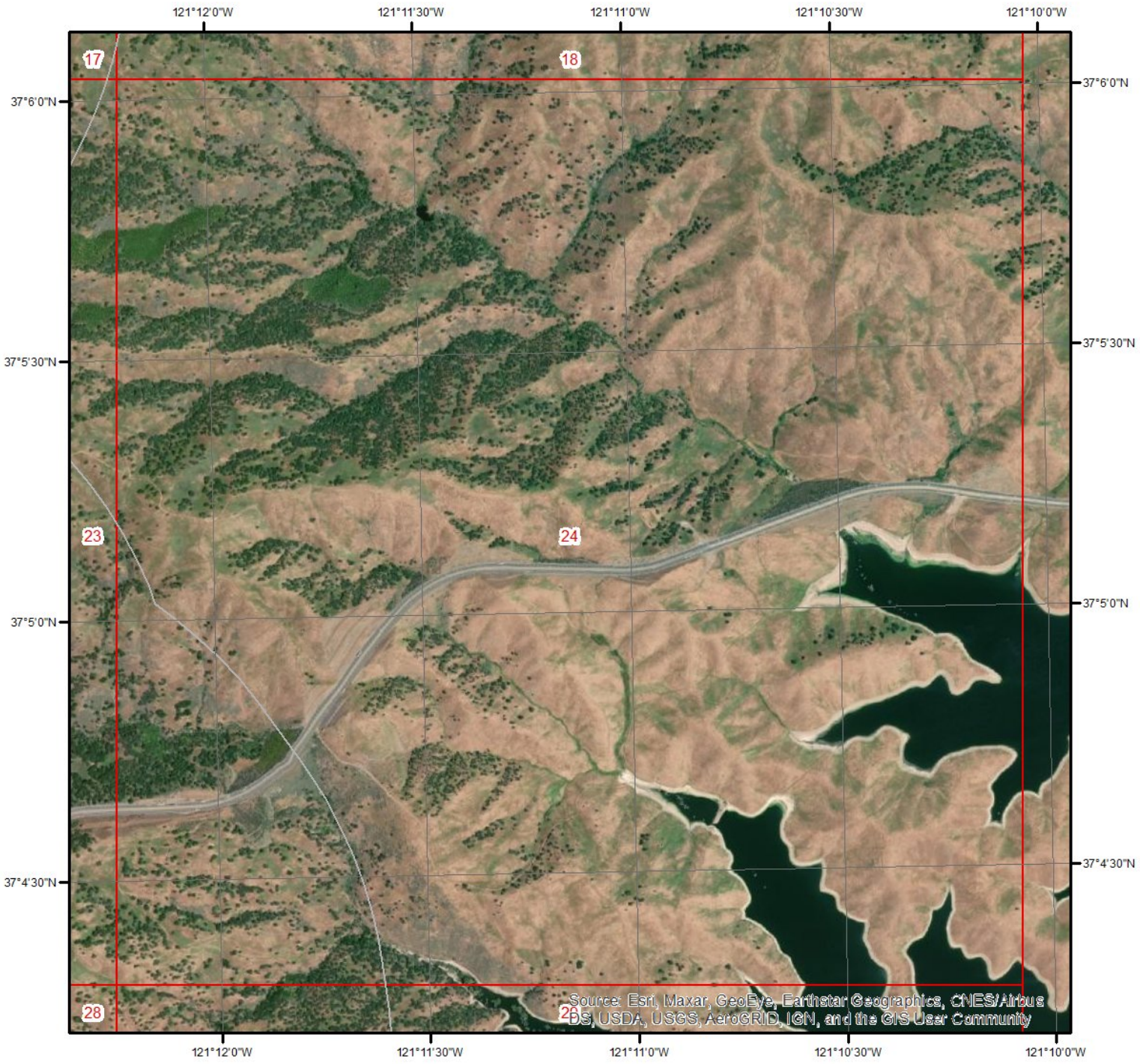
ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Wells and Additional Sources



Wells & Additional Sources - Page 24

- ▲ Sites with Higher Elevation
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Miles
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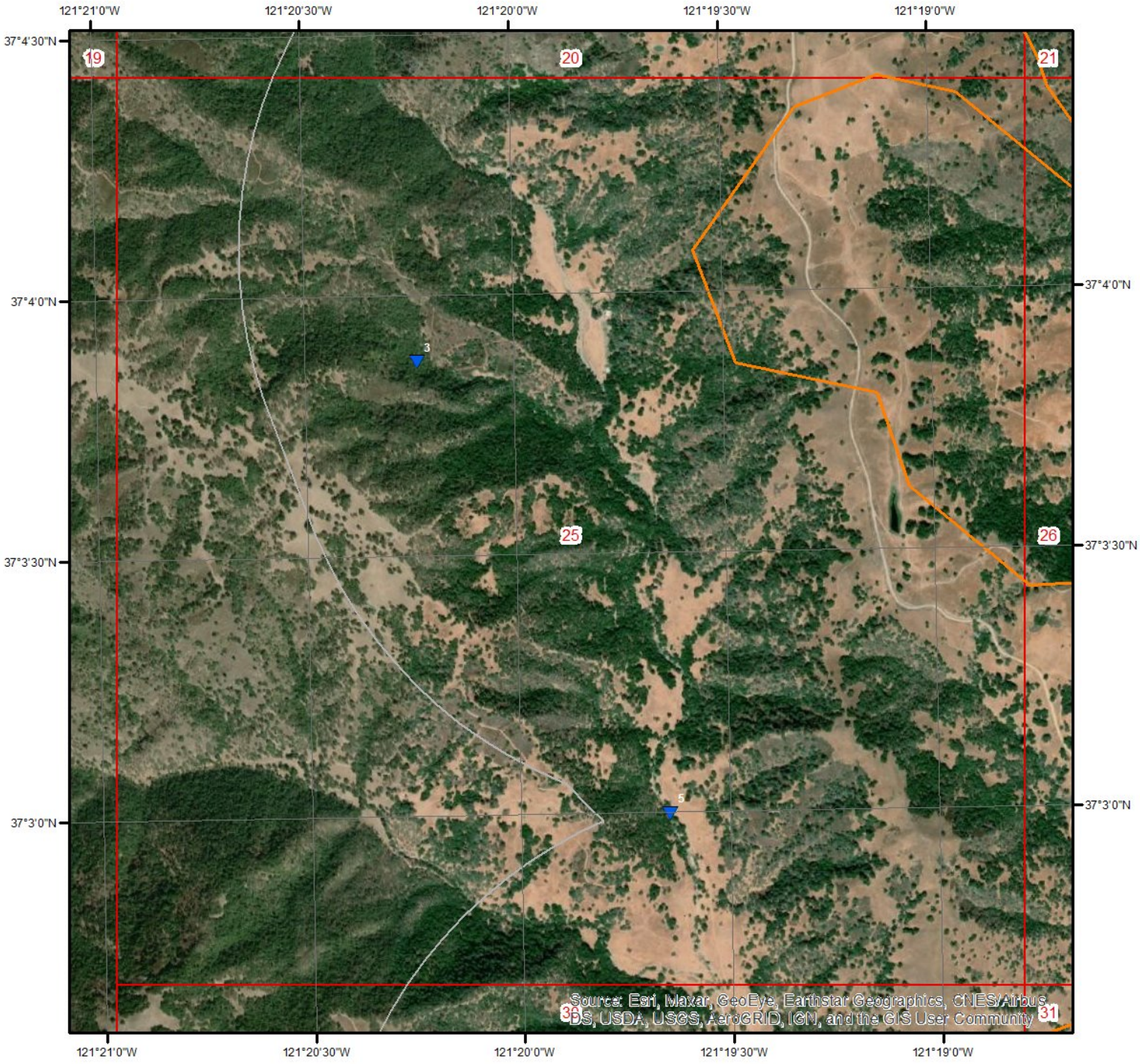
ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Wells and Additional Sources



Wells & Additional Sources - Page 25

- ▲ Sites with Higher Elevation
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- ▼ Sites with Lower Elevation
- ○ Sites with Unknown Elevation

Miles
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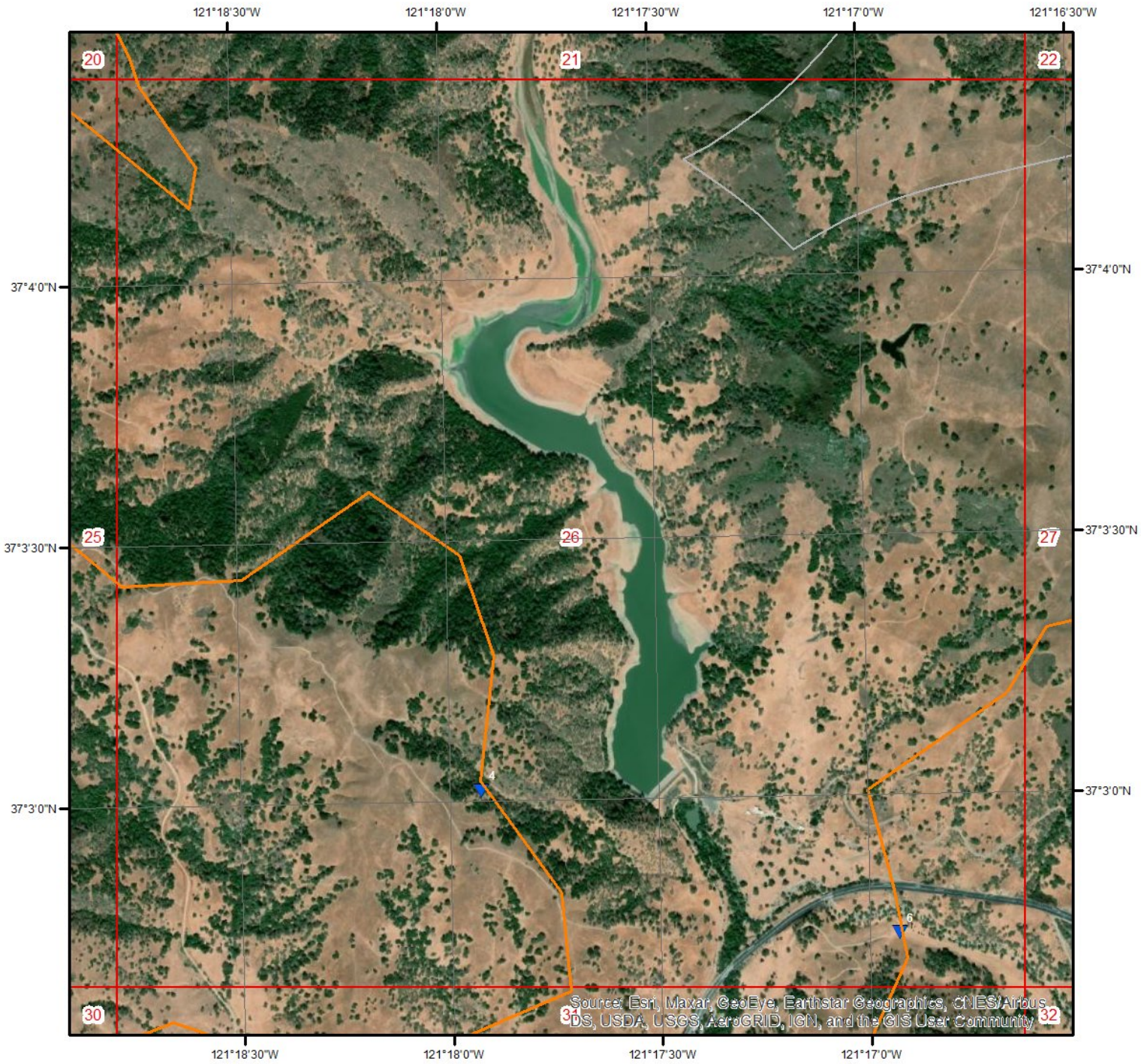
ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Wells and Additional Sources



Wells & Additional Sources - Page 26

- ▲ Sites with Higher Elevation
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Miles
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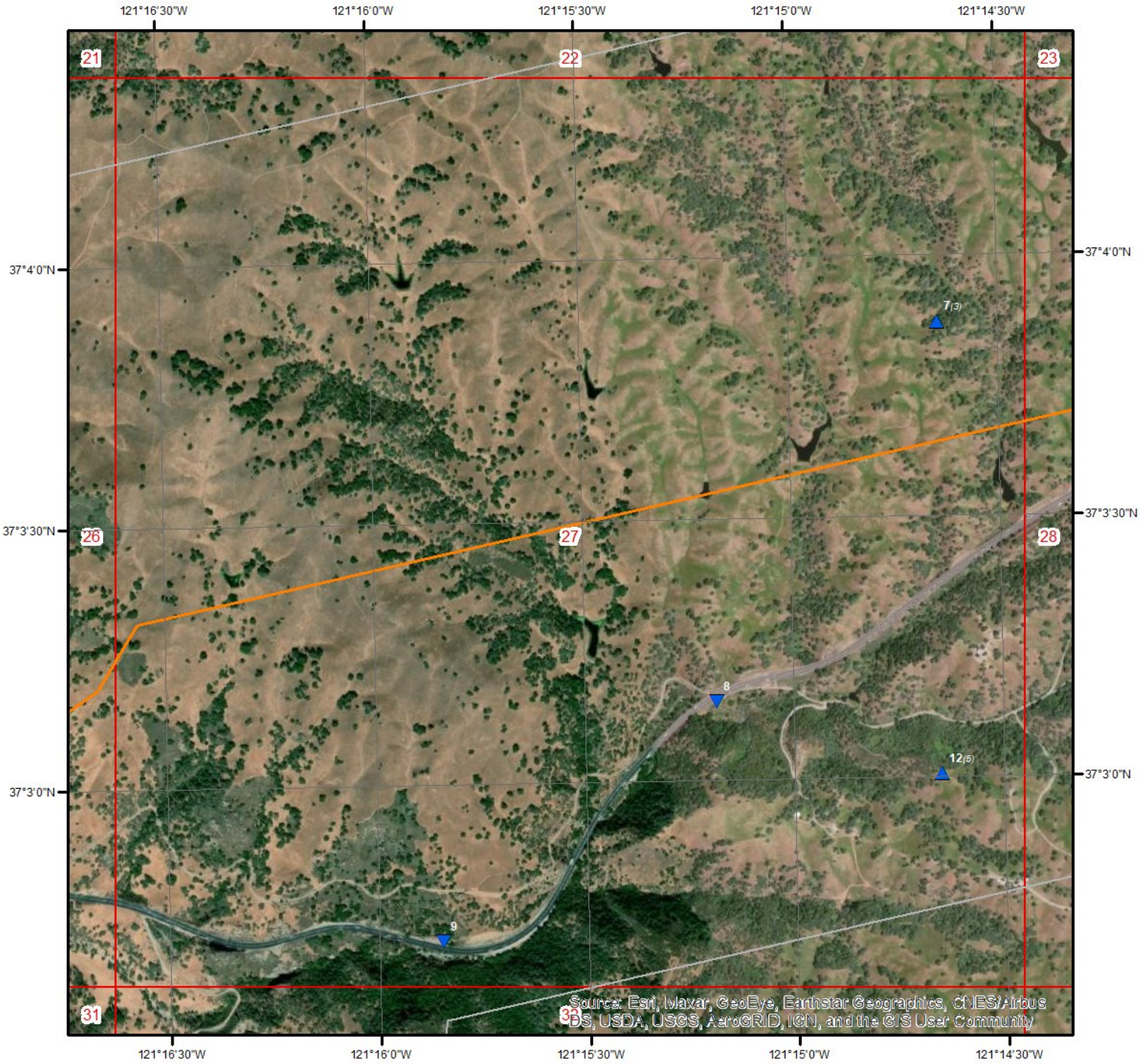
ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Wells and Additional Sources



Wells & Additional Sources - Page 27

- ▲ Sites with Higher Elevation
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Miles
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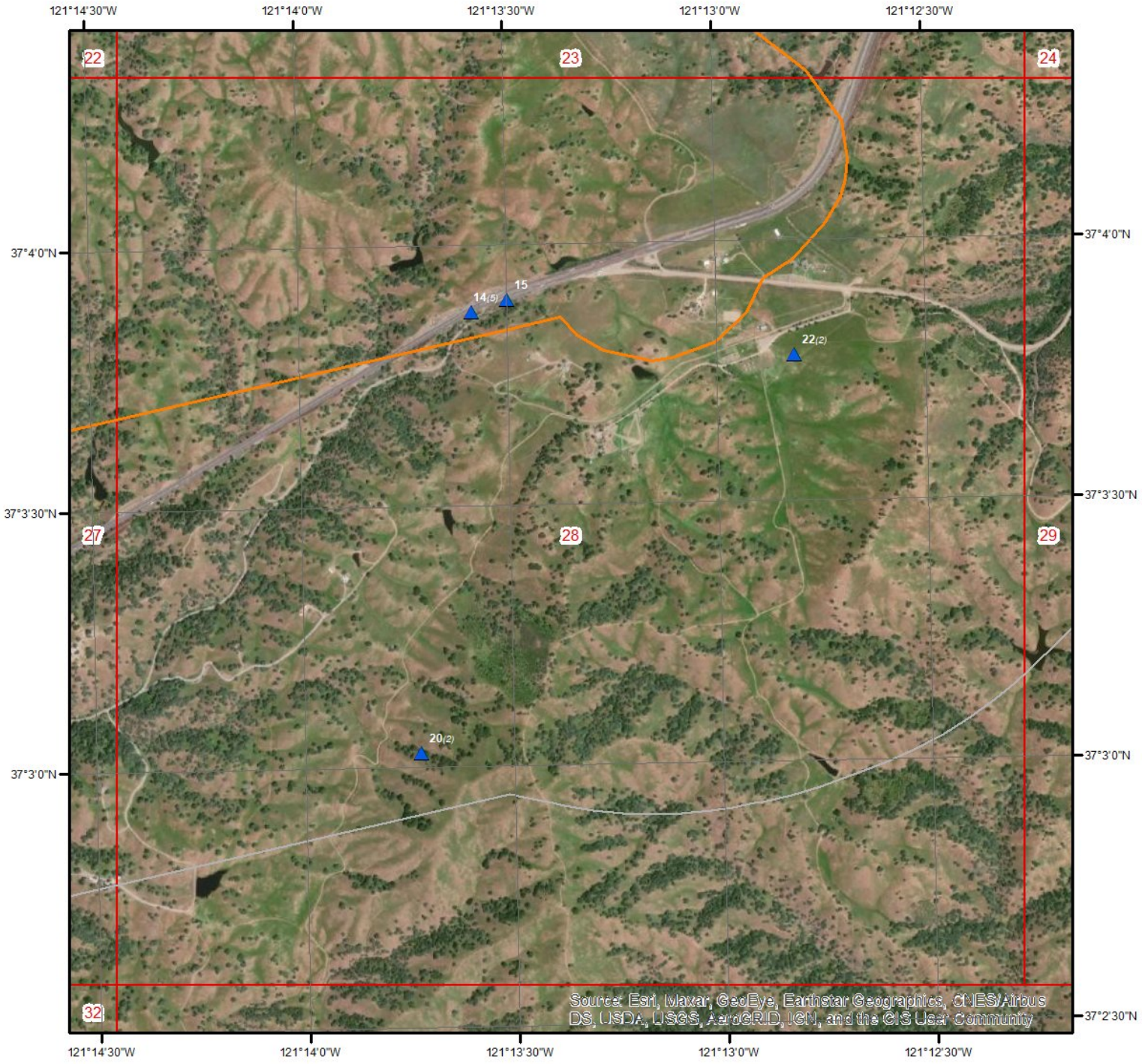
ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Wells and Additional Sources



Wells & Additional Sources - Page 28

- ▲ Sites with Higher Elevation
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Miles
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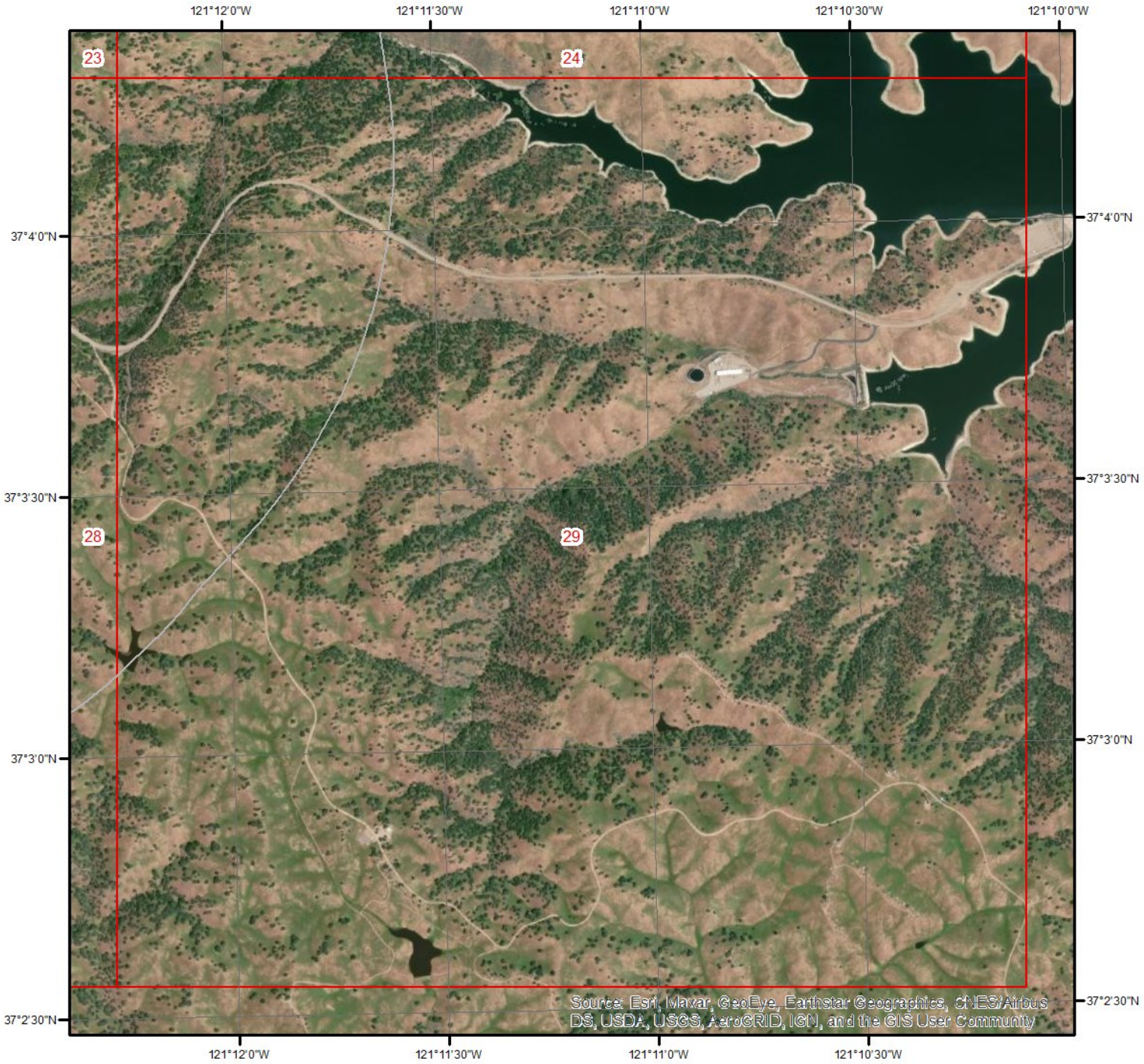
ENVIRONMENTAL RISK INFORMATION SERVICES

Wells and Additional Sources



Wells & Additional Sources - Page 29

- ▲ Sites with Higher Elevation
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- ▼ Sites with Lower Elevation
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Miles
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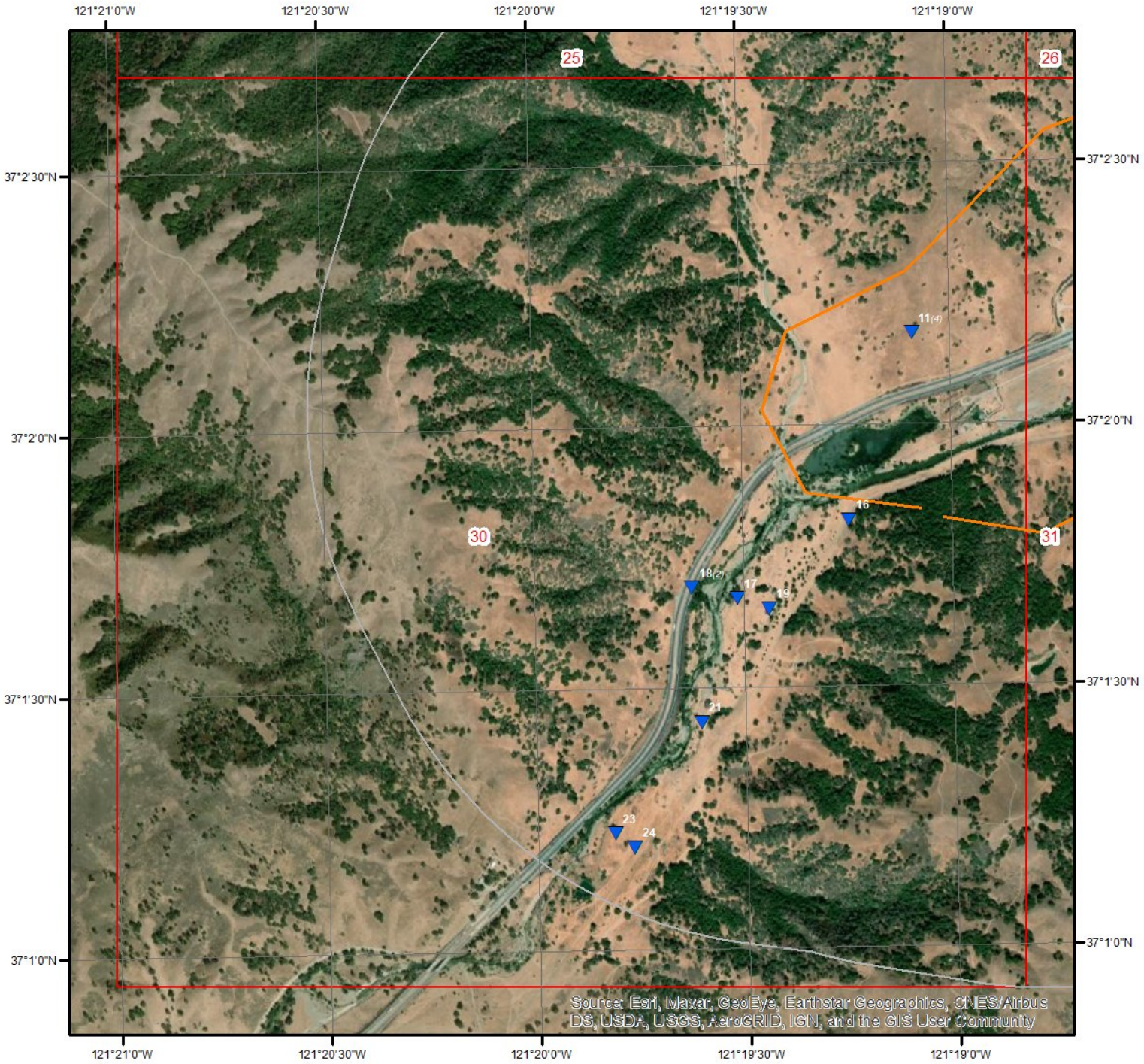
ENVIRONMENTAL RISK INFORMATION SERVICES

Wells and Additional Sources



Wells & Additional Sources - Page 30

- ▲ Sites with Higher Elevation
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- ▼ Sites with Lower Elevation
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Miles
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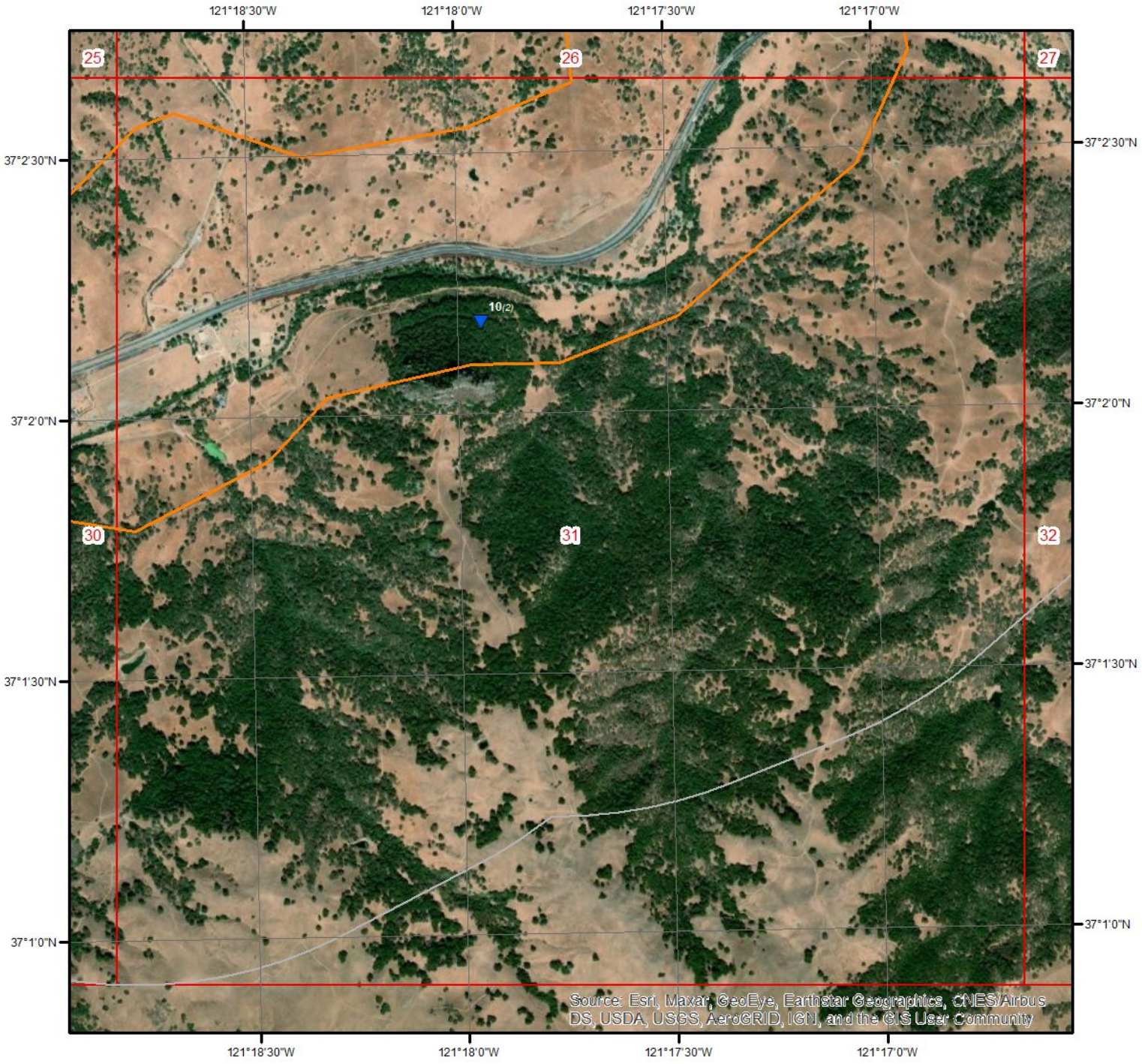
ENVIRONMENTAL RISK INFORMATION SERVICES

Wells and Additional Sources



Wells & Additional Sources - Page 31

- ▲ Sites with Higher Elevation
- ■ Sites with Same Elevation
- ▼ Sites with Lower Elevation
- ○ Sites with Unknown Elevation

Miles
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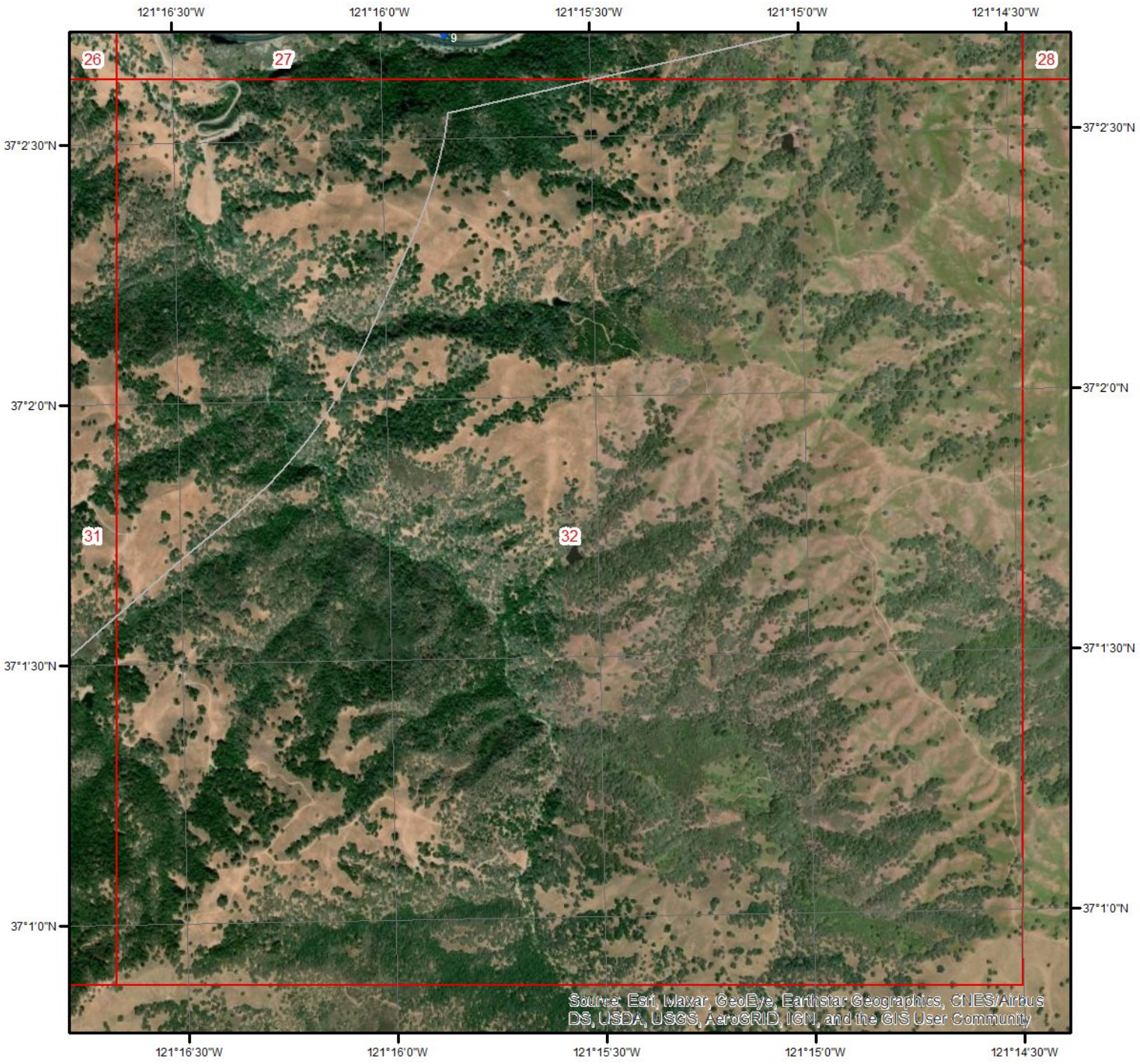
ENVIRONMENTAL RISK INFORMATION SERVICES

Wells and Additional Sources



Wells & Additional Sources - Page 32

- ▲ Sites with Higher Elevation
- ■ Sites with Same Elevation
- ▼ Sites with Lower Elevation
- ○ Sites with Unknown Elevation

Miles
0 0.15 0.3 0.6

N

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

Wells and Additional Sources Summary

Federal Sources

Public Water Systems Violations and Enforcement Data

Map Key	PWS ID	Distance (ft)	Direction
18	CA4300824	1,725.68	SSW
18	CA4300852	1,725.68	SSW

Safe Drinking Water Information System (SDWIS)

Map Key	ID	Distance (ft)	Direction
	No records found		

USGS National Water Information System

Map Key	Monitoring Loc Identifier	Distance (ft)	Direction
5	USGS-11152900	4,709.64	SSW

State Sources

Oil and Gas Wells

Map Key	ID	Distance (ft)	Direction
	No records found		

Periodic Groundwater Level Measurement Locations

Map Key	ID	Distance (ft)	Direction
	No records found		

Well Completion Reports

Map Key	WCR No	Distance (ft)	Direction
1	WCR0211532	1,879.33	WSW
1	WCR0058870	1,879.33	WSW
1	WCR1989-002957	1,879.33	WSW
1	WCR2000-004390	1,879.33	WSW
2	WCR2004-004175	3,117.15	W
2	WCR0199958	3,117.15	W
2	WCR2004-004176	3,117.15	W
2	WCR2004-004177	3,117.15	W
2	WCR2004-004178	3,117.15	W
2	WCR2000-003759	3,117.15	W
3	WCR1994-007062	3,458.17	SW
4	WCR0035442	62.24	S
6	WCR2017-010736	33.45	SSE
7	WCR1990-008937	1,357.94	SE
7	WCR0289048	1,357.94	SE
7	WCR1994-005874	1,357.94	SE

Wells and Additional Sources Summary

8	WCR2017-005094	2,377.18	SE
9	WCR2016-012265	4,382.47	SSE
10	WCR0224074	493.66	S
10	WCR2007-005723	493.66	S
11	WCR0080984	677.82	S
11	WCR2005-000766	677.82	S
11	WCR0227975	677.82	S
11	WCR2003-005209	677.82	S
12	WCR0289049	3,775.17	SE
12	WCR1977-000696	3,775.17	SE
12	WCR1977-000697	3,775.17	SE
12	WCR2001-006130	3,775.17	SE
12	WCR1977-000695	3,775.17	SE
13	WCR2015-005566	578.94	ENE
14	WCR0023981	285.82	ESE
14	WCR0128925	285.82	ESE
14	WCR0116383	285.82	ESE
14	WCR0239504	285.82	ESE
14	WCR2004-000766	285.82	ESE
15	WCR2017-005090	333.03	ESE
16	WCR2017-010735	251.59	SSW
17	WCR2019-007861	1,466.46	SSW
19	WCR2019-007863	1,416.93	SSW
20	WCR2002-004925	4,589.78	SE
20	WCR2005-007569	4,589.78	SE
21	WCR2019-007857	2,932.09	SSW
22	WCR0303723	750.18	ESE
22	WCR0265267	750.18	ESE
23	WCR2019-006477	4,542.04	SSW
24	WCR2019-006475	4,579.75	SSW

Public Water Systems Violations and Enforcement Data

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
18	SSW	0.33	1,725.68	342.35	PWSV

Address Line 2: 13151 PACHECO PASS HWY
State Code: CA
Zip Code: 95046
City Name: SAN MARTIN
Address Line 1: ROLL ON INN WATER SYSTEM
PWS ID: CA4300824
PWS Type Code: TNCWS
PWS Type Description: Transient Non-Community Water System
Primary Source Code: GW
Primary Source Desc: Groundwater
PWS Activity Code: I
PWS Activity Description: Inactive
PWS Deactivation Date: 01/06/1993
Phone Number:

--Details--
Population Served Count: 125
City Served:
County Served:
State Served: CA
Zip Code Served:

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
18	SSW	0.33	1,725.68	342.35	PWSV

Address Line 2: 13151 PACHECO PASS HWY
State Code: CA
Zip Code: 95046
City Name: SAN MARTIN
Address Line 1: CANCILLA'S COUNTRY INN
PWS ID: CA4300852
PWS Type Code: TNCWS
PWS Type Description: Transient Non-Community Water System
Primary Source Code: GW
Primary Source Desc: Groundwater
PWS Activity Code: I
PWS Activity Description: Inactive
PWS Deactivation Date: 01/06/1993
Phone Number:

Wells and Additional Sources Detail Report

--Details--

Population Served Count: 125
City Served:
County Served:
State Served: CA
Zip Code Served:

USGS National Water Information System

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
5	SSW	0.89	4,709.64	383.87	FED USGS

Organiz Identifier: USGS-CA
Organiz Name: USGS California Water Science Center
Well Depth:
Well Depth Unit:
Well Hole Depth:
W Hole Depth Unit:
Construction Date:
Source Map Scale:
Monitoring Loc Name: CEDAR C NR BELL STATION CA
Monitoring Loc Identifier: USGS-11152900
Monitoring Loc Type: Stream
Monitoring Loc Desc:
HUC Eight Digit Code: 18060002
Drainage Area: 12.8
Drainage Area Unit: sq mi
Contrib Drainage Area:
Contrib Drainage Area Unit:
Horizontal Accuracy: 5
Horizontal Accuracy Unit: seconds
Horizontal Collection Mthd: Interpolated from MAP.
Horiz Coord Refer System: NAD83
Vertical Measure:
Vertical Measure Unit:
Vertical Accuracy:
Vertical Accuracy Unit:
Vertical Collection Mthd:
Vert Coord Refer System:
Formation Type:
Aquifer Name:
Aquifer Type:
Country Code: US
Provider Name: NWIS
County: SANTA CLARA
Latitude: 37.0499451
Longitude: -121.327431

Well Completion Reports

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
1	WSW	0.36	1,879.33	1,519.56	WATER WELLS

WCR No: WCR0211532
County: Santa Clara

County(OSWCR):	Santa Clara	Decimal Latitude:	37.09432
Decimal Lat(OSWCR):	37.09432	Decimal Longitude:	-121.33556
Decim Long(OSWCR):	-121.33556		
Location(OSWCR):	None		
City(OSWCR):	None		
Location:	None		
City:	None		
Original Source:	California Department of Water Resources - OSWCR(Well Numbers), as of Apr 29, 2020; California Department of Water Resources - Well Completion Reports		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
1	WSW	0.36	1,879.33	1,519.56	WATER WELLS

WCR No:	WCR0058870	County:	Santa Clara
County(OSWCR):	Santa Clara	Decimal Latitude:	37.09432
Decimal Lat(OSWCR):	37.09432	Decimal Longitude:	-121.33556
Decim Long(OSWCR):	-121.33556		
Location(OSWCR):	None		
City(OSWCR):	None		
Location:	None		
City:	None		
Original Source:	California Department of Water Resources - OSWCR(Well Numbers), as of Apr 29, 2020; California Department of Water Resources - Well Completion Reports		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
1	WSW	0.36	1,879.33	1,519.56	WATER WELLS

WCR No:	WCR1989-002957	County:	Santa Clara
County(OSWCR):	Santa Clara	Decimal Latitude:	37.09432
Decimal Lat(OSWCR):	37.09432	Decimal Longitude:	-121.33556
Decim Long(OSWCR):	-121.33556		
Location(OSWCR):	None		
City(OSWCR):	HOLLISTER		
Location:	None		
City:	HOLLISTER		
Original Source:	California Department of Water Resources - OSWCR(Well Numbers), as of Apr 29, 2020; California Department of Water Resources - Well Completion Reports		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
1	WSW	0.36	1,879.33	1,519.56	WATER WELLS

WCR No:	WCR2000-004390	County:	Santa Clara
County(OSWCR):	Santa Clara	Decimal Latitude:	37.09432
Decimal Lat(OSWCR):	37.09432	Decimal Longitude:	-121.33556
Decim Long(OSWCR):	-121.33556		
Location(OSWCR):	None		
City(OSWCR):	GILROY		

Location: None
City: GILROY
Original Source: California Department of Water Resources - OSWCR(Well Numbers), as of Apr 29, 2020; California Department of Water Resources - Well Completion Reports

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
2	W	0.59	3,117.15	1,934.68	WATER WELLS

WCR No: WCR2004-004175
County: Santa Clara
County(OSWCR): Santa Clara
Decimal Latitude: 37.11033
Decimal Lat(OSWCR): 37.11033
Decimal Longitude: -121.35756
Decim Long(OSWCR): -121.35756
Location(OSWCR): DOWDY RANCH HENRY COE PARK
City(OSWCR): GILROY
Location: DOWDY RANCH HENRY COE PARK
City: GILROY
Original Source: California Department of Water Resources - OSWCR(Well Numbers), as of Apr 29, 2020; California Department of Water Resources - Well Completion Reports

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
2	W	0.59	3,117.15	1,934.68	WATER WELLS

WCR No: WCR0199958
County: Santa Clara
County(OSWCR): Santa Clara
Decimal Latitude: 37.11033
Decimal Lat(OSWCR): 37.11033
Decimal Longitude: -121.35756
Decim Long(OSWCR): -121.35756
Location(OSWCR): None
City(OSWCR): None
Location: None
City: None
Original Source: California Department of Water Resources - OSWCR(Well Numbers), as of Apr 29, 2020; California Department of Water Resources - Well Completion Reports

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
2	W	0.59	3,117.15	1,934.68	WATER WELLS

WCR No: WCR2004-004176
County: Santa Clara
County(OSWCR): Santa Clara
Decimal Latitude: 37.11033
Decimal Lat(OSWCR): 37.11033
Decimal Longitude: -121.35756
Decim Long(OSWCR): -121.35756
Location(OSWCR): DOWDY RANCH HENRY COE PARK
City(OSWCR): GILROY
Location: DOWDY RANCH HENRY COE PARK
City: GILROY
Original Source: California Department of Water Resources - OSWCR(Well Numbers), as of Apr 29, 2020; California Department of Water Resources - Well Completion Reports

Wells and Additional Sources Detail Report

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
2	W	0.59	3,117.15	1,934.68	WATER WELLS

WCR No:	WCR2004-004177	County:	Santa Clara
County(OSWCR):	Santa Clara	Decimal Latitude:	37.11033
Decimal Lat(OSWCR):	37.11033	Decimal Longitude:	-121.35756
Decim Long(OSWCR):	-121.35756		
Location(OSWCR):	DOWDY RANCH, HENRY COE PARK		
City(OSWCR):	GILROY		
Location:	DOWDY RANCH, HENRY COE PARK		
City:	GILROY		
Original Source:	California Department of Water Resources - OSWCR(Well Numbers), as of Apr 29, 2020; California Department of Water Resources - Well Completion Reports		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
2	W	0.59	3,117.15	1,934.68	WATER WELLS

WCR No:	WCR2004-004178	County:	Santa Clara
County(OSWCR):	Santa Clara	Decimal Latitude:	37.11033
Decimal Lat(OSWCR):	37.11033	Decimal Longitude:	-121.35756
Decim Long(OSWCR):	-121.35756		
Location(OSWCR):	DOWDY RANCH HENRY COE PARK		
City(OSWCR):	GILROY		
Location:	DOWDY RANCH HENRY COE PARK		
City:	GILROY		
Original Source:	California Department of Water Resources - OSWCR(Well Numbers), as of Apr 29, 2020; California Department of Water Resources - Well Completion Reports		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
2	W	0.59	3,117.15	1,934.68	WATER WELLS

WCR No:	WCR2000-003759	County:	Santa Clara
County(OSWCR):	Santa Clara	Decimal Latitude:	37.11033
Decimal Lat(OSWCR):	37.11033	Decimal Longitude:	-121.35756
Decim Long(OSWCR):	-121.35756		
Location(OSWCR):	None		
City(OSWCR):	GILROY		
Location:	None		
City:	GILROY		
Original Source:	California Department of Water Resources - OSWCR(Well Numbers), as of Apr 29, 2020; California Department of Water Resources - Well Completion Reports		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
3	SW	0.65	3,458.17	799.57	WATER WELLS

WCR No:	WCR1994-007062	County:	Santa Clara

County(OSWCR):	Santa Clara	Decimal Latitude:	37.06451
Decimal Lat(OSWCR):	37.06451	Decimal Longitude:	-121.33723
Decim Long(OSWCR):	-121.33723		
Location(OSWCR):	None		
City(OSWCR):	PACHECO PASS		
Location:	None		
City:	PACHECO PASS		
Original Source:	California Department of Water Resources - OSWCR(Well Numbers), as of Apr 29, 2020; California Department of Water Resources - Well Completion Reports		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
4	S	0.01	62.24	964.13	WATER WELLS

WCR No:	WCR0035442	County:	Monterey
County(OSWCR):	Monterey	Decimal Latitude:	37.05033
Decimal Lat(OSWCR):	37.05033	Decimal Longitude:	-121.29879
Decim Long(OSWCR):	-121.29879		
Location(OSWCR):	RELIZ CANYON (ANTHONY RANCH)		
City(OSWCR):	GREENFIELD		
Location:	RELIZ CANYON (ANTHONY RANCH)		
City:	GREENFIELD		
Original Source:	California Department of Water Resources - OSWCR(Well Numbers), as of Apr 29, 2020; California Department of Water Resources - Well Completion Reports		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
6	SSE	0.01	33.45	430.87	WATER WELLS

WCR No:	WCR2017-010736	County:	San Benito
County(OSWCR):	San Benito	Decimal Latitude:	37.045555
Decimal Lat(OSWCR):	37.045555	Decimal Longitude:	-121.282222
Decim Long(OSWCR):	-121.282222		
Location(OSWCR):	ACROSS FROM CA 152 AND EI TORO		
City(OSWCR):	HOLLISTER		
Location:	ACROSS FROM CA 152 AND EI TORO		
City:	HOLLISTER		
Original Source:	California Department of Water Resources - OSWCR(Well Numbers), as of Apr 29, 2020; California Department of Water Resources - Well Completion Reports		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
7	SE	0.26	1,357.94	1,315.68	WATER WELLS

WCR No:	WCR1990-008937	County:	Santa Clara
County(OSWCR):	Santa Clara	Decimal Latitude:	37.06453
Decimal Lat(OSWCR):	37.06453	Decimal Longitude:	-121.24411
Decim Long(OSWCR):	-121.24411		
Location(OSWCR):	None		
City(OSWCR):	None		

Location: None
City: None
Original Source: California Department of Water Resources - OSWCR(Well Numbers), as of Apr 29, 2020; California Department of Water Resources - Well Completion Reports

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
7	SE	0.26	1,357.94	1,315.68	WATER WELLS

WCR No: WCR0289048
County: Santa Clara
County(OSWCR): Santa Clara
Decimal Latitude: 37.06453
Decimal Lat(OSWCR): 37.06453
Decimal Longitude: -121.24411
Decim Long(OSWCR): -121.24411
Location(OSWCR): None
City(OSWCR): None
Location: None
City: None
Original Source: California Department of Water Resources - OSWCR(Well Numbers), as of Apr 29, 2020; California Department of Water Resources - Well Completion Reports

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
7	SE	0.26	1,357.94	1,315.68	WATER WELLS

WCR No: WCR1994-005874
County: Santa Clara
County(OSWCR): Santa Clara
Decimal Latitude: 37.06453
Decimal Lat(OSWCR): 37.06453
Decimal Longitude: -121.24411
Decim Long(OSWCR): -121.24411
Location(OSWCR): None
City(OSWCR): SANTA CLARA
Location: None
City: SANTA CLARA
Original Source: California Department of Water Resources - OSWCR(Well Numbers), as of Apr 29, 2020; California Department of Water Resources - Well Completion Reports

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
8	SE	0.45	2,377.18	1,079.59	WATER WELLS

WCR No: WCR2017-005094
County: Santa Clara
County(OSWCR): Santa Clara
Decimal Latitude: 37.0525051
Decimal Lat(OSWCR): 37.0525051
Decimal Longitude: -121.2531505
Decim Long(OSWCR): -121.2531505
Location(OSWCR): 0 Pacheco Pass Hwy 152 HWY
City(OSWCR): Santa Clara County
Location: 0 Pacheco Pass Hwy 152 HWY
City: Santa Clara County
Original Source: California Department of Water Resources - OSWCR(Well Numbers), as of Apr 29, 2020; California Department of Water Resources - Well Completion Reports

Wells and Additional Sources Detail Report

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
9	SSE	0.83	4,382.47	799.56	WATER WELLS

WCR No:	WCR2016-012265	County:	Santa Clara
County(OSWCR):	Santa Clara	Decimal Latitude:	37.045
Decimal Lat(OSWCR):	37.045	Decimal Longitude:	-121.264167
Decim Long(OSWCR):	-121.264167		
Location(OSWCR):	17652-17664 PACHECO PASS HIGHWAY		
City(OSWCR):	HOLLISTER		
Location:	17652-17664 PACHECO PASS HIGHWAY		
City:	HOLLISTER		
Original Source:	California Department of Water Resources - OSWCR(Well Numbers), as of Apr 29, 2020; California Department of Water Resources - Well Completion Reports		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
10	S	0.09	493.66	510.28	WATER WELLS

WCR No:	WCR0224074	County:	Santa Clara
County(OSWCR):	Santa Clara	Decimal Latitude:	37.03626
Decimal Lat(OSWCR):	37.03626	Decimal Longitude:	-121.29909
Decim Long(OSWCR):	-121.29909		
Location(OSWCR):	None		
City(OSWCR):	None		
Location:	None		
City:	None		
Original Source:	California Department of Water Resources - OSWCR(Well Numbers), as of Apr 29, 2020; California Department of Water Resources - Well Completion Reports		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
10	S	0.09	493.66	510.28	WATER WELLS

WCR No:	WCR2007-005723	County:	Santa Clara
County(OSWCR):	Santa Clara	Decimal Latitude:	37.03626
Decimal Lat(OSWCR):	37.03626	Decimal Longitude:	-121.29909
Decim Long(OSWCR):	-121.29909		
Location(OSWCR):	PACHECO PASS HWY		
City(OSWCR):	GILROY		
Location:	PACHECO PASS HWY		
City:	GILROY		
Original Source:	California Department of Water Resources - OSWCR(Well Numbers), as of Apr 29, 2020; California Department of Water Resources - Well Completion Reports		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
11	S	0.13	677.82	599.43	WATER WELLS

WCR No:	WCR0080984	County:	Santa Clara

County(OSWCR):	Santa Clara	Decimal Latitude:	37.03621
Decimal Lat(OSWCR):	37.03621	Decimal Longitude:	-121.3182
Decim Long(OSWCR):	-121.3182		
Location(OSWCR):	None		
City(OSWCR):	None		
Location:	None		
City:	None		
Original Source:	California Department of Water Resources - OSWCR(Well Numbers), as of Apr 29, 2020; California Department of Water Resources - Well Completion Reports		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
11	S	0.13	677.82	599.43	WATER WELLS

WCR No:	WCR2005-000766	County:	Santa Clara
County(OSWCR):	Santa Clara	Decimal Latitude:	37.03621
Decimal Lat(OSWCR):	37.03621	Decimal Longitude:	-121.3182
Decim Long(OSWCR):	-121.3182		
Location(OSWCR):	14880 PACHECO PASS HWY		
City(OSWCR):	HOLLISTER		
Location:	14880 PACHECO PASS HWY		
City:	HOLLISTER		
Original Source:	California Department of Water Resources - OSWCR(Well Numbers), as of Apr 29, 2020; California Department of Water Resources - Well Completion Reports		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
11	S	0.13	677.82	599.43	WATER WELLS

WCR No:	WCR0227975	County:	Santa Clara
County(OSWCR):	Santa Clara	Decimal Latitude:	37.03621
Decimal Lat(OSWCR):	37.03621	Decimal Longitude:	-121.3182
Decim Long(OSWCR):	-121.3182		
Location(OSWCR):	PACHECO PASS MAINT STA ROUTE 152		
City(OSWCR):	None		
Location:	PACHECO PASS MAINT STA ROUTE 152		
City:	None		
Original Source:	California Department of Water Resources - OSWCR(Well Numbers), as of Apr 29, 2020; California Department of Water Resources - Well Completion Reports		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
11	S	0.13	677.82	599.43	WATER WELLS

WCR No:	WCR2003-005209	County:	Santa Clara
County(OSWCR):	Santa Clara	Decimal Latitude:	37.03621
Decimal Lat(OSWCR):	37.03621	Decimal Longitude:	-121.3182
Decim Long(OSWCR):	-121.3182		
Location(OSWCR):	None		
City(OSWCR):	SAN JOSE		

Location: None
City: SAN JOSE
Original Source: California Department of Water Resources - OSWCR(Well Numbers), as of Apr 29, 2020; California Department of Water Resources - Well Completion Reports

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
12	SE	0.71	3,775.17	1,322.89	WATER WELLS

WCR No: WCR0289049
County: Santa Clara
County(OSWCR): Santa Clara
Decimal Latitude: 37.0501
Decimal Lat(OSWCR): 37.0501
Decimal Longitude: -121.24421
Decim Long(OSWCR): -121.24421
Location(OSWCR): None
City(OSWCR): None
Location: None
City: None
Original Source: California Department of Water Resources - OSWCR(Well Numbers), as of Apr 29, 2020; California Department of Water Resources - Well Completion Reports

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
12	SE	0.71	3,775.17	1,322.89	WATER WELLS

WCR No: WCR1977-000696
County: Santa Clara
County(OSWCR): Santa Clara
Decimal Latitude: 37.0501
Decimal Lat(OSWCR): 37.0501
Decimal Longitude: -121.24421
Decim Long(OSWCR): -121.24421
Location(OSWCR): None
City(OSWCR): PACHECO PASS
Location: None
City: PACHECO PASS
Original Source: California Department of Water Resources - OSWCR(Well Numbers), as of Apr 29, 2020; California Department of Water Resources - Well Completion Reports

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
12	SE	0.71	3,775.17	1,322.89	WATER WELLS

WCR No: WCR1977-000697
County: Santa Clara
County(OSWCR): Santa Clara
Decimal Latitude: 37.0501
Decimal Lat(OSWCR): 37.0501
Decimal Longitude: -121.24421
Decim Long(OSWCR): -121.24421
Location(OSWCR): None
City(OSWCR): PACHECO PASS
Location: None
City: PACHECO PASS
Original Source: California Department of Water Resources - OSWCR(Well Numbers), as of Apr 29, 2020; California Department of Water Resources - Well Completion Reports

Wells and Additional Sources Detail Report

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
12	SE	0.71	3,775.17	1,322.89	WATER WELLS

WCR No:	WCR2001-006130	County:	Santa Clara
County(OSWCR):	Santa Clara	Decimal Latitude:	37.0501
Decimal Lat(OSWCR):	37.0501	Decimal Longitude:	-121.24421
Decim Long(OSWCR):	-121.24421		
Location(OSWCR):	None		
City(OSWCR):	GILROY		
Location:	None		
City:	GILROY		
Original Source:	California Department of Water Resources - OSWCR(Well Numbers), as of Apr 29, 2020; California Department of Water Resources - Well Completion Reports		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
12	SE	0.71	3,775.17	1,322.89	WATER WELLS

WCR No:	WCR1977-000695	County:	Santa Clara
County(OSWCR):	Santa Clara	Decimal Latitude:	37.0501
Decimal Lat(OSWCR):	37.0501	Decimal Longitude:	-121.24421
Decim Long(OSWCR):	-121.24421		
Location(OSWCR):	None		
City(OSWCR):	PACHECO PASS		
Location:	None		
City:	PACHECO PASS		
Original Source:	California Department of Water Resources - OSWCR(Well Numbers), as of Apr 29, 2020; California Department of Water Resources - Well Completion Reports		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
13	ENE	0.11	578.94	1,610.80	WATER WELLS

WCR No:	WCR2015-005566	County:	Santa Clara
County(OSWCR):	Santa Clara	Decimal Latitude:	37.127778
Decimal Lat(OSWCR):	37.127778	Decimal Longitude:	-121.221667
Decim Long(OSWCR):	-121.221667		
Location(OSWCR):	640 EAST DUNNE AVENUE		
City(OSWCR):	MORGAN HILL		
Location:	640 EAST DUNNE AVENUE		
City:	MORGAN HILL		
Original Source:	California Department of Water Resources - OSWCR(Well Numbers), as of Apr 29, 2020; California Department of Water Resources - Well Completion Reports		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
14	ESE	0.05	285.82	1,334.20	WATER WELLS

WCR No:	WCR0023981	County:	Merced

County(OSWCR):	Merced	Decimal Latitude:	37.06452
Decimal Lat(OSWCR):	37.06452	Decimal Longitude:	-121.22645
Decim Long(OSWCR):	-121.22645		
Location(OSWCR):	None		
City(OSWCR):	None		
Location:	None		
City:	None		
Original Source:	California Department of Water Resources - OSWCR(Well Numbers), as of Apr 29, 2020; California Department of Water Resources - Well Completion Reports		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
14	ESE	0.05	285.82	1,334.20	WATER WELLS

WCR No:	WCR0128925	County:	Merced
County(OSWCR):	Merced	Decimal Latitude:	37.06452
Decimal Lat(OSWCR):	37.06452	Decimal Longitude:	-121.22645
Decim Long(OSWCR):	-121.22645		
Location(OSWCR):	None		
City(OSWCR):	None		
Location:	None		
City:	None		
Original Source:	California Department of Water Resources - OSWCR(Well Numbers), as of Apr 29, 2020; California Department of Water Resources - Well Completion Reports		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
14	ESE	0.05	285.82	1,334.20	WATER WELLS

WCR No:	WCR0116383	County:	Santa Clara
County(OSWCR):	Santa Clara	Decimal Latitude:	37.06452
Decimal Lat(OSWCR):	37.06452	Decimal Longitude:	-121.22645
Decim Long(OSWCR):	-121.22645		
Location(OSWCR):	None		
City(OSWCR):	None		
Location:	None		
City:	None		
Original Source:	California Department of Water Resources - OSWCR(Well Numbers), as of Apr 29, 2020; California Department of Water Resources - Well Completion Reports		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
14	ESE	0.05	285.82	1,334.20	WATER WELLS

WCR No:	WCR0239504	County:	Merced
County(OSWCR):	Merced	Decimal Latitude:	37.06452
Decimal Lat(OSWCR):	37.06452	Decimal Longitude:	-121.22645
Decim Long(OSWCR):	-121.22645		
Location(OSWCR):	None		
City(OSWCR):	None		

Location: None
City: None
Original Source: California Department of Water Resources - OSWCR(Well Numbers), as of Apr 29, 2020; California Department of Water Resources - Well Completion Reports

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
14	ESE	0.05	285.82	1,334.20	WATER WELLS

WCR No: WCR2004-000766
County: Santa Clara
County(OSWCR): Santa Clara
Decimal Latitude: 37.06452
Decimal Lat(OSWCR): 37.06452
Decimal Longitude: -121.22645
Decim Long(OSWCR): -121.22645
Location(OSWCR): DINOSOAR PT RD.PARLECO ST PARK
City(OSWCR): HOLLISTER
Location: DINOSOAR PT RD.PARLECO ST PARK
City: HOLLISTER
Original Source: California Department of Water Resources - OSWCR(Well Numbers), as of Apr 29, 2020; California Department of Water Resources - Well Completion Reports

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
15	ESE	0.06	333.03	1,335.21	WATER WELLS

WCR No: WCR2017-005090
County: Santa Clara
County(OSWCR): Santa Clara
Decimal Latitude: 37.0648926
Decimal Lat(OSWCR): 37.0648926
Decimal Longitude: -121.2250329
Decim Long(OSWCR): -121.2250329
Location(OSWCR): 0 Pacheco Pass Hwy 152 HWY
City(OSWCR): Santa Clara County
Location: 0 Pacheco Pass Hwy 152 HWY
City: Santa Clara County
Original Source: California Department of Water Resources - OSWCR(Well Numbers), as of Apr 29, 2020; California Department of Water Resources - Well Completion Reports

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
16	SSW	0.05	251.59	343.14	WATER WELLS

WCR No: WCR2017-010735
County: San Benito
County(OSWCR): San Benito
Decimal Latitude: 37.030277
Decimal Lat(OSWCR): 37.030277
Decimal Longitude: -121.320833
Decim Long(OSWCR): -121.320833
Location(OSWCR): ACROSS FROM CA 152 AND KAISER AETNA RD.
City(OSWCR): HOLLISTER
Location: ACROSS FROM CA 152 AND KAISER AETNA RD.
City: HOLLISTER
Original Source: California Department of Water Resources - OSWCR(Well Numbers), as of Apr 29, 2020; California Department of Water Resources - Well Completion Reports

Wells and Additional Sources Detail Report

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
17	SSW	0.28	1,466.46	324.72	WATER WELLS

WCR No:	WCR2019-007861	County:	Santa Clara
County(OSWCR):	Santa Clara	Decimal Latitude:	37.0278182
Decimal Lat(OSWCR):	37.0278182	Decimal Longitude:	-121.32531771
Decim Long(OSWCR):	-121.32531771		
Location(OSWCR):	14610 Pacheco Pass HWY		
City(OSWCR):	Gilroy		
Location:	14610 Pacheco Pass HWY		
City:	Gilroy		
Original Source:	California Department of Water Resources - OSWCR(Well Numbers), as of Apr 29, 2020; California Department of Water Resources - Well Completion Reports		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
19	SSW	0.27	1,416.93	327.44	WATER WELLS

WCR No:	WCR2019-007863	County:	Santa Clara
County(OSWCR):	Santa Clara	Decimal Latitude:	37.02747599
Decimal Lat(OSWCR):	37.02747599	Decimal Longitude:	-121.32405231
Decim Long(OSWCR):	-121.32405231		
Location(OSWCR):	14610 Pacheco Pass HWY		
City(OSWCR):	Gilroy		
Location:	14610 Pacheco Pass HWY		
City:	Gilroy		
Original Source:	California Department of Water Resources - OSWCR(Well Numbers), as of Apr 29, 2020; California Department of Water Resources - Well Completion Reports		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
20	SE	0.87	4,589.78	1,555.41	WATER WELLS

WCR No:	WCR2002-004925	County:	Santa Clara
County(OSWCR):	Santa Clara	Decimal Latitude:	37.05044
Decimal Lat(OSWCR):	37.05044	Decimal Longitude:	-121.22875
Decim Long(OSWCR):	-121.22875		
Location(OSWCR):	None		
City(OSWCR):	GILROY		
Location:	None		
City:	GILROY		
Original Source:	California Department of Water Resources - OSWCR(Well Numbers), as of Apr 29, 2020; California Department of Water Resources - Well Completion Reports		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
20	SE	0.87	4,589.78	1,555.41	WATER WELLS

WCR No:	WCR2005-007569	County:	Santa Clara

County(OSWCR):	Santa Clara	Decimal Latitude:	37.05044
Decimal Lat(OSWCR):	37.05044	Decimal Longitude:	-121.22875
Decim Long(OSWCR):	-121.22875		
Location(OSWCR):	OLD PACHECO PASS HWY		
City(OSWCR):	GILROY		
Location:	OLD PACHECO PASS HWY		
City:	GILROY		
Original Source:	California Department of Water Resources - OSWCR(Well Numbers), as of Apr 29, 2020; California Department of Water Resources - Well Completion Reports		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
21	SSW	0.56	2,932.09	319.21	WATER WELLS

WCR No:	WCR2019-007857	County:	Santa Clara
County(OSWCR):	Santa Clara	Decimal Latitude:	37.02388265
Decimal Lat(OSWCR):	37.02388265	Decimal Longitude:	-121.32680531
Decim Long(OSWCR):	-121.32680531		
Location(OSWCR):	14610 Pacheco Pass HWY		
City(OSWCR):	Gilroy		
Location:	14610 Pacheco Pass HWY		
City:	Gilroy		
Original Source:	California Department of Water Resources - OSWCR(Well Numbers), as of Apr 29, 2020; California Department of Water Resources - Well Completion Reports		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
22	ESE	0.14	750.18	1,380.94	WATER WELLS

WCR No:	WCR0303723	County:	Santa Clara
County(OSWCR):	Santa Clara	Decimal Latitude:	37.06299
Decimal Lat(OSWCR):	37.06299	Decimal Longitude:	-121.21359
Decim Long(OSWCR):	-121.21359		
Location(OSWCR):	None		
City(OSWCR):	None		
Location:	None		
City:	None		
Original Source:	California Department of Water Resources - OSWCR(Well Numbers), as of Apr 29, 2020; California Department of Water Resources - Well Completion Reports		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
22	ESE	0.14	750.18	1,380.94	WATER WELLS

WCR No:	WCR0265267	County:	Santa Clara
County(OSWCR):	Santa Clara	Decimal Latitude:	37.06299
Decimal Lat(OSWCR):	37.06299	Decimal Longitude:	-121.21359
Decim Long(OSWCR):	-121.21359		
Location(OSWCR):	None		
City(OSWCR):	None		

Wells and Additional Sources Detail Report

Location: None
City: None
Original Source: California Department of Water Resources - OSWCR(Well Numbers), as of Apr 29, 2020; California Department of Water Resources - Well Completion Reports

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
23	SSW	0.86	4,542.04	317.31	WATER WELLS

WCR No: WCR2019-006477
County: Santa Clara
County(OSWCR): Santa Clara
Decimal Latitude: 37.02036837
Decimal Lat(OSWCR): 37.02036837
Decimal Longitude: -121.33031693
Decim Long(OSWCR): -121.33031693
Location(OSWCR): 12163 Pacheco Pass HWY
City(OSWCR): Gilroy
Location: 12163 Pacheco Pass HWY
City: Gilroy
Original Source: California Department of Water Resources - OSWCR(Well Numbers), as of Apr 29, 2020; California Department of Water Resources - Well Completion Reports

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
24	SSW	0.87	4,579.75	316.63	WATER WELLS

WCR No: WCR2019-006475
County: Santa Clara
County(OSWCR): Santa Clara
Decimal Latitude: 37.01992158
Decimal Lat(OSWCR): 37.01992158
Decimal Longitude: -121.32955354
Decim Long(OSWCR): -121.32955354
Location(OSWCR): 12163 Pacheco Pass HWY
City(OSWCR): Gilroy
Location: 12163 Pacheco Pass HWY
City: Gilroy
Original Source: California Department of Water Resources - OSWCR(Well Numbers), as of Apr 29, 2020; California Department of Water Resources - Well Completion Reports

Radon Information

This section lists any relevant radon information found for the target property.

Federal EPA Radon Zone for *MERCED* County: **3**
Federal EPA Radon Zone for *STANISLAUS* County: **3**
Federal EPA Radon Zone for *SANTA CLARA* County: **2**

Zone 1: Counties with predicted average indoor radon screening levels greater than 4 pCi/L
Zone 2: Counties with predicted average indoor radon screening levels from 2 to 4 pCi/L
Zone 3: Counties with predicted average indoor radon screening levels less than 2 pCi/L

Federal Area Radon Information for *SANTA CLARA* County

No Measures/Homes:	77
Geometric Mean:	0.7
Arithmetic Mean:	1.4
Median:	1
Standard Deviation:	1.9
Maximum:	9.2
% >4 pCi/L:	9
% >20 pCi/L:	0
Notes on Data Table:	TABLE 1. Screening indoor radon data from the EPA/State Residential Radon Survey of California conducted during 1989-90. Data represent 2-7 day charcoal canister measurements from the lowest level of each home tested.

Federal Area Radon Information for *MERCED* County

No Measures/Homes:	10
Geometric Mean:	1.3
Arithmetic Mean:	2.1
Median:	1.7
Standard Deviation:	1.8
Maximum:	6.1
% >4 pCi/L:	10
% >20 pCi/L:	0
Notes on Data Table:	TABLE 1. Screening indoor radon data from the EPA/State Residential Radon Survey of California conducted during 1989-90. Data represent 2-7 day charcoal canister measurements from the lowest level of each home tested.

Federal Area Radon Information for *STANISLAUS* County

No Measures/Homes:	14
Geometric Mean:	1.2
Arithmetic Mean:	1.8
Median:	1.3
Standard Deviation:	1.5
Maximum:	5.9
% >4 pCi/L:	7

Radon Information

% >20 pCi/L:	0
Notes on Data Table:	TABLE 1. Screening indoor radon data from the EPA/State Residential Radon Survey of California conducted during 1989-90. Data represent 2-7 day charcoal canister measurements from the lowest level of each home tested.

Appendix

Federal Sources

FEMA National Flood Hazard Layer — **FEMA FLOOD**

The National Flood Hazard Layer (NFHL) data incorporates Flood Insurance Rate Map (FIRM) databases published by the Federal Emergency Management Agency (FEMA), and any Letters Of Map Revision (LOMRs) that have been issued against those databases since their publication date. The FIRM Database is the digital, geospatial version of the flood hazard information shown on the published paper FIRMs. The FIRM Database depicts flood risk information and supporting data used to develop the risk data. The FIRM Database is derived from Flood Insurance Studies (FISs), previously published FIRMs, flood hazard analyses performed in support of the FISs and FIRMs, and new mapping data, where available.

Indoor Radon Data — **INDOOR RADON**

Indoor radon measurements tracked by the Environmental Protection Agency(EPA) and the State Residential Radon Survey.

Public Water Systems Violations and Enforcement Data — **PWSV**

List of drinking water violations and enforcement actions from the Safe Drinking Water Information System (SDWIS) made available by the Drinking Water Protection Division of the US EPA's Office of Groundwater and Drinking Water. Enforcement sensitive actions are not included in the data released by the EPA. Address information provided in SWDIS may correspond either with the physical location of the water system, or with a contact address.

Radon Zone Level — **RADON ZONE**

Areas showing the level of Radon Zones (level 1, 2 or 3) by county. This data is maintained by the Environmental Protection Agency (EPA).

Safe Drinking Water Information System (SDWIS) — **SDWIS**

The Safe Drinking Water Information System (SDWIS) contains information about public water systems as reported to US Environmental Protection Agency (EPA) by the states. Addresses may correspond with the location of the water system, or with a contact address.

Soil Survey Geographic database — **SSURGO**

The Soil Survey Geographic database (SSURGO) contains information about soil as collected by the National Cooperative Soil Survey at the Natural Resources Conservation Service (NRCS). Soil maps outline areas called map units. The map units are linked to soil properties in a database. Each map unit may contain one to three major components and some minor components.

U.S. Fish & Wildlife Service Wetland Data — **US WETLAND**

The U.S. Fish & Wildlife Service Wetland layer represents the approximate location and type of wetlands and deepwater habitats in the United States.

USGS Current Topo — **US TOPO**

US Topo topographic maps are produced by the National Geospatial Program of the U.S. Geological Survey (USGS). The project was launched in late 2009, and the term "US Topo" refers specifically to quadrangle topographic maps published in 2009 and later.

USGS Geology — **US GEOLOGY**

Seamless maps depicting geological information provided by the United States Geological Survey (USGS).

USGS National Water Information System — **FED USGS**

The U.S. Geological Survey (USGS)'s National Water Information System (NWIS) is the nation's principal repository of water resources data. This database includes comprehensive information of well-construction details, time-series data for gage height, streamflow, groundwater level, and precipitation and water use data.

State Sources

Oil and Gas Wells — **OGW**

A list of Oil and Gas well locations. This is provided by California's Department of Conservation Division of

Appendix

Oil, Gas and Geothermal Resources.

Periodic Groundwater Level Measurement Locations **MONITOR WELLS**

Locations of groundwater level monitoring wells in the Department of Water Resources (DWR)'s Periodic Groundwater Levels dataset. The DWR Periodic Groundwater Levels dataset contains seasonal and long-term groundwater level measurements collected by the Department of Water Resources and cooperating agencies.

Well Completion Reports **WATER WELLS**

List of wells from the Well Completion Reports data made available by the California Department of Water Resources' (DWR) Online System for Well Completion Reports (OSWCR). Please note that the majority of well completion reports have been spatially registered to the center of the 1x1 mile Public Land Survey System section that the well is located in.

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Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

Public Draft Initial Study/Mitigated Negative Declaration

Appendix G:

Noise

Existing Ambient Noise Survey

Long-Term Noise Measurement Summary

KEY: Orange cells are for input.
Grey cells are intermediate calculations performed by the model.
Green cells are data to present in a written analysis (output).

Measurement Site: near dam construction site LT 1
Measurement Date: 2/3/2021
Project Name: Pacheco Reservoir

			Computation of CNEL						
Hour of Day (military time)	Sound Level Leq (dBA)	Sound Power =10*Log(dBA/10)	Period of 24-Hour Day (1=included, 0=not)			Sound Power Breakdown by Period of Day			
			Day	Evening	Night	Day	Evening	Night	
0:00	39.4	8,710	0	0	1	0	0	8,710	
1:00	38.9	7,762	0	0	1	0	0	7,762	
2:00	38.7	7,413	0	0	1	0	0	7,413	
3:00	46.3	42,658	0	0	1	0	0	42,658	
4:00	43.2	20,893	0	0	1	0	0	20,893	
5:00	43.2	20,893	0	0	1	0	0	20,893	
6:00	44.7	29,512	0	0	1	0	0	29,512	
7:00	44.5	28,184	1	0	0	28,184	0	0	
8:00	42.0	15,849	1	0	0	15,849	0	0	
9:00	44.7	29,512	1	0	0	29,512	0	0	
10:00	41.4	13,804	1	0	0	13,804	0	0	
11:00	42.1	16,218	1	0	0	16,218	0	0	
12:00	45.2	33,113	1	0	0	33,113	0	0	
13:00	46.9	48,978	1	0	0	48,978	0	0	
14:00	46.7	46,774	1	0	0	46,774	0	0	
15:00	46.1	40,738	1	0	0	40,738	0	0	start time
16:00	47.4	54,954	1	0	0	54,954	0	0	
17:00	45.2	33,113	1	0	0	33,113	0	0	
18:00	45.9	38,905	1	0	0	38,905	0	0	
19:00	45.9	38,905	0	1	0	0	38,905	0	
20:00	44.9	30,903	0	1	0	0	30,903	0	
21:00	43.7	23,442	0	1	0	0	23,442	0	
22:00	40.7	11,749	0	0	1	0	0	11,749	
23:00	41.9	15,488	0	0	1	0	0	15,488	

Sum of Sound Power during Period wo/penalty	400,141	93,250	165,078
Log Factor for CNEL Penalty (i.e., 10*log(x))	1	3	10
Sound Power during Period with penalty	400,141	279,749	1,650,783

Total Daily Sound Power, with penalties	2,330,673
Hours per Day	24
Average Hourly Sound Power, with penalties	97,111
CNEL	49.9

Ldn computation on next page.

Computation of Ldn

Period of 24-Hour Day (1=included, 0=not)		Sound Power Breakdown by Period of Day	
Day	Night	Day	Night
0	1	0	8,710
0	1	0	7,762
0	1	0	7,413
0	1	0	42,658
0	1	0	20,893
0	1	0	20,893
0	1	0	29,512
1	0	28,184	0
1	0	15,849	0
1	0	29,512	0
1	0	13,804	0
1	0	16,218	0
1	0	33,113	0
1	0	48,978	0
1	0	46,774	0
1	0	40,738	0
1	0	54,954	0
1	0	33,113	0
1	0	38,905	0
1	0	38,905	0
1	0	30,903	0
1	0	23,442	0
0	1	0	11,749
0	1	0	15,488

Sum of Sound Power during Period wo/penalty	493,391	165,078
Log Factor for Penalty (i.e., 10*log(x))	1	10
Sound Power during Period with penalty	493,391	1,650,783

Total Daily Sound Power, with penalties	2,144,174
Hours per Day	24
Average Hourly Sound Power, with penalties	89,341
Ldn	49.5

Notes:

Computation of the CNEL based on 1-hour Leq measurements for each hour of a day are based on equation 2-27 on pg. 2-57 of Caltrans 2009.

Computation of the Ldn based on 1-hour Leq measurements for each hour of a day are based on equation 2-26 on pg. 2-56 of Caltrans 2009.

Log factors for the Ldn and CNEL penalties are provided in Table 2-12 on pg. 2-52 of Caltrans 2009.

Source:

California Deaprtment of Transportation (Caltrans), Divisiong of Environmental Analysis. 2009 (November). *2009 Technical Noise Supplement* . Sacramento, CA. Available: <http://www.dot.ca.gov/hq/env/noise/>. Accessed September 24, 2010.

Long-Term Noise Measurement Summary

KEY: Orange cells are for input.
Grey cells are intermediate calculations performed by the model.
Green cells are data to present in a written analysis (output).

Measurement Site: Proposed site of Edgewood hotel complex LT2
Measurement Date: 4/25/2024
Project Name: Pacheco GEOTECH - Keiser Aetna Rd

Hour of Day (military time)	Sound Level Leq (dBA)	Sound Power =10*Log(dBA/10)	Computation of CNEL: Period of 24-Hour Day (1=included, 0=not) Day	Evening	Night	Sound Power Breakdown by Period of Day Day	Evening	Night
0:00	56.2	416,869	0	0	1	0	0	416,869
1:00	56.7	467,735	0	0	1	0	0	467,735
2:00	57.1	512,861	0	0	1	0	0	512,861
3:00	59.2	831,764	0	0	1	0	0	831,764
4:00	60.7	1,174,898	0	0	1	0	0	1,174,898
5:00	61.0	1,258,925	0	0	1	0	0	1,258,925
6:00	62.2	1,659,587	0	0	1	0	0	1,659,587
7:00	63.6	2,290,868	1	0	0	2,290,868	0	0
8:00	64.4	2,754,229	1	0	0	2,754,229	0	0
9:00	61.9	1,548,817	1	0	0	1,548,817	0	0
10:00	61.4	1,380,384	1	0	0	1,380,384	0	0
11:00	62.1	1,621,810	1	0	0	1,621,810	0	0
12:00	62.3	1,698,244	1	0	0	1,698,244	0	0
13:00	62.7	1,862,087	1	0	0	1,862,087	0	0
14:00	61.1	1,288,250	1	0	0	1,288,250	0	0
15:00	61.4	1,380,384	1	0	0	1,380,384	0	0
16:00	60.9	1,230,269	1	0	0	1,230,269	0	0
17:00	60.9	1,230,269	1	0	0	1,230,269	0	0
18:00	61.6	1,445,440	1	0	0	1,445,440	0	0
19:00	62.3	1,698,244	0	1	0	0	1,698,244	0
20:00	61.0	1,258,925	0	1	0	0	1,258,925	0
21:00	60.0	1,000,000	0	1	0	0	1,000,000	0
22:00	59.1	812,831	0	0	1	0	0	812,831
23:00	58.0	630,957	0	0	1	0	0	630,957
		1						
			Sum of Sound Power during Period wo/penalty			19,731,049	3,957,169	7,766,427
			Log Factor for CNEL Penalty (i.e., 10*log(x))			1	3	10
			Sound Power during Period with penalty			19,731,049	11,871,507	77,664,274

Total Daily Sound Power, with penalties	109,266,831
Hours per Day	24
Average Hourly Sound Power, with penalties	4,552,785
CNEL	66.6

Ldn computation on next page.

Computation of Ldn

Period of 24-Hour Day (1=included, 0=not)		Sound Power Breakdown by Period of Day	
Day	Night	Day	Night
0	1	0	416,869
0	1	0	467,735
0	1	0	512,861
0	1	0	831,764
0	1	0	1,174,898
0	1	0	1,258,925
0	1	0	1,659,587
1	0	2,290,868	0
1	0	2,754,229	0
1	0	1,548,817	0
1	0	1,380,384	0
1	0	1,621,810	0
1	0	1,698,244	0
1	0	1,862,087	0
1	0	1,288,250	0
1	0	1,380,384	0
1	0	1,230,269	0
1	0	1,230,269	0
1	0	1,445,440	0
1	0	1,698,244	0
1	0	1,258,925	0
1	0	1,000,000	0
0	1	0	812,831
0	1	0	630,957

Sum of Sound Power during Period wo/penalty	23,688,218	7,766,427
Log Factor for Penalty (i.e., 10*log(x))	1	10
Sound Power during Period with penalty	23,688,218	77,664,274

Total Daily Sound Power, with penalties	101,352,492
Hours per Day	24
Average Hourly Sound Power, with penalties	4,223,021
Ldn	66.3

Notes:

Computation of the CNEL based on 1-hour Leq measurements for each hour of a day are based on equation 2-27 on pg. 2-57 of Caltrans 2009.

Computation of the Ldn based on 1-hour Leq measurements for each hour of a day are based on equation 2-26 on pg. 2-56 of Caltrans 2009.

Log factors for the Ldn and CNEL penalties are provided in Table 2-12 on pg. 2-52 of Caltrans 2009.

Source:

California Deaprtment of Transportation (Caltrans), Divisiong of Environmental Analysis. 2009 (November). *2009 Technical Noise Supplement* . Sacramento, CA. Available: <http://www.dot.ca.gov/hq/env/noise/>. Accessed September 24, 2010.

12-Hour Leq Calculator (Nightitme Leq)

Hour	Hourly Leq (dB)	Linear Power (P)	
1	61.1	1288249.552	
2	61.4	1380384.265	
3	60.9	1230268.771	
4	60.9	1230268.771	
5	61.6	1445439.771	
6	63.6	2290867.653	
7	64.4	2754228.703	
8	61.9	1548816.619	
9	61.4	1380384.265	
10	62.1	1621810.097	
11	62.3	1698243.652	
12	62.7	1862087.137	
	Sum	19731049.25	
	Avg. Sound Power	1644254.105	
	12-hour Leq	**62.2**	Existing 12-hour Leq

Note

The sheet converts dBA noise levels to sound power (watts), for each individual hour of the measurment period. Then SP values are summed and averaged, then converted back to dBA to obtain the 8-hour Leq

12-Hour Leq Calculator (Nightitme Leq)

Hour	Hourly Leq (dB)	Linear Power (P)
1	62.3	1698243.652
2	61	1258925.412
3	60	1000000
4	59.1	812830.5162
5	58	630957.3445
6	56.2	416869.3835
7	56.7	467735.1413
8	57.1	512861.384
9	59.2	831763.7711
10	60.7	1174897.555
11	61	1258925.412
12	62.2	1659586.907
	Sum	11723596.48
	Avg. Sound Power	976966.3732
	12-hour Leq	**59.9**

Existing 12-hour Leq

Note

The sheet converts dBA noise levels to sound power (watts), for each individual hour of the measurment period. Then SP values are summed and averaged, then converted back to dBA to obtain the 8-hour Leq

LT 2: Raw Data Output

Date	Start Time	End Time	Duration	Leq	Lmax
4/25/2024	2:00:00 PM	3:00:00 PM	1:00:00	61.1	71.9
4/25/2024	3:00:00 PM	4:00:00 PM	1:00:00	61.4	75.4
4/25/2024	4:00:00 PM	5:00:00 PM	1:00:00	60.9	77
4/25/2024	5:00:00 PM	6:00:00 PM	1:00:00	60.9	83.7
4/25/2024	6:00:00 PM	7:00:00 PM	1:00:00	61.6	71.2
4/25/2024	7:00:00 PM	8:00:00 PM	1:00:00	62.3	72.1
4/25/2024	8:00:00 PM	9:00:00 PM	1:00:00	61	72.5
4/25/2024	9:00:00 PM	10:00:00 PM	1:00:00	60	71.4
4/25/2024	10:00:00 PM	11:00:00 PM	1:00:00	59.1	73.1
4/25/2024	11:00:00 PM	12:00:00 AM	1:00:00	58	68.8
4/26/2024	12:00:00 AM	1:00:00 AM	1:00:00	56.2	68.9
4/26/2024	1:00:00 AM	2:00:00 AM	1:00:00	56.7	69
4/26/2024	2:00:00 AM	3:00:00 AM	1:00:00	57.1	71.7
4/26/2024	3:00:00 AM	4:00:00 AM	1:00:00	59.2	80.3
4/26/2024	4:00:00 AM	5:00:00 AM	1:00:00	60.7	71.7
4/26/2024	5:00:00 AM	6:00:00 AM	1:00:00	61	75.2
4/26/2024	6:00:00 AM	7:00:00 AM	1:00:00	62.2	76.7
4/26/2024	7:00:00 AM	8:00:00 AM	1:00:00	63.6	79.6
4/26/2024	8:00:00 AM	9:00:00 AM	1:00:00	64.4	82.4
4/26/2024	9:00:00 AM	10:00:00 AM	1:00:00	61.9	74.1
4/26/2024	10:00:00 AM	11:00:00 AM	1:00:00	61.4	71.2
4/26/2024	11:00:00 AM	12:00:00 PM	1:00:00	62.1	71.6
4/26/2024	12:00:00 PM	1:00:00 PM	1:00:00	62.3	77
4/26/2024	1:00:00 PM	2:00:00 PM	1:00:00	62.7	74.6

Summary- ST 1

File Name on Meter	LxT_Data.056.s
File Name on PC	LxT_0003285-20210203 153220-LxT_Data.056.ldbi
Serial Number	0003285
Model	SoundTrack LxT®
Firmware Version	2.302
User	
Location	
Job Description	
Note	

Measurement

Description	
Start	2021-02-03 15:32:20
Stop	2021-02-03 15:47:23
Duration	00:15:02.3
Run Time	00:15:02.3
Pause	00:00:00.0
Pre-Calibration	2021-02-03 15:31:06
Post-Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting		
Peak Weight	A Weighting		
Detector	Slow		
Preamplifier	PRMLxT1L		
Microphone Correction	Off		
Integration Method	Linear		
Overload	121.8 dB		
	A	**C**	**Z**
Under Range Peak	**78.1**	75.1	80.1
Under Range Limit	**26.1**	25.9	31.0
Noise Floor	16.5	16.7	21.9

Results

LA_{eq}	51.9		
LAE	81.4		
EA	15.399 µPa²h		
EA8	491.517 µPa²h		
EA40	2.458 mPa²h		
$LA_{peak\ (max)}$	2021-02-03 15:33:38	81.3	dB
LAS_{max}	2021-02-03 15:40:54	62.1	dB
LAS_{min}	2021-02-03 15:32:43	37.4	dB
SEA	-99.94 dB		

LAS > 85.0 dB (Exceedance Counts / Duration)	0	0.0 s
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0 s
LApeak > 135.0 dB (Exceedance Counts / Duration)	0	0.0 s
LApeak > 137.0 dB (Exceedance Counts / Duration)	0	0.0 s
LApeak > 140.0 dB (Exceedance Counts / Duration)	0	0.0 s

LCeq	65.1	dB
LAeq	51.9	dB
LCeq - LAeq	13.2	dB
LAIeq	53.0	dB
LAeq	51.9	dB
LAIeq - LAeq	1.1	dB

	A		
	dB	**Time Stamp**	**dB**
Leq	51.9		65.1
LS(max)	62.1	2021/02/03 15:40:54	
LS(min)	37.4	2021/02/03 15:32:43	
LPeak(max)	81.3	2021/02/03 15:33:38	

Overload Count	0	
Overload Duration	0.0	s

Dose Settings

Dose Name	OSHA-1	OSHA-2	
Exchange Rate	5	3	dB
Threshold	90	80	dB
Criterion Level	90	90	dB
Criterion Duration	8	8	h

Results

Dose	0.01	0.00	%
Projected Dose	0.47	0.02	%
TWA (Projected)	51.4	51.9	dB
TWA (t)	26.4	36.8	dB
Lep (t)	36.8	36.8	dB

Statistics

LAI5.00	55.3	dB
LAI10.00	53.9	dB
LAI33.30	52.0	dB
LAI50.00	50.9	dB
LAI66.60	49.7	dB
LAI90.00	46.9	dB

Calibration History

Preamp	**Date**	**dB re. 1V/Pa**
PRMLxT1L	2021-02-03 15:31:03	-28.14

PRMLxT1L	2020-04-23 12:50:26	-27.93
PRMLxT1L	2020-02-27 05:51:17	-28.11
PRMLxT1L	2020-02-26 09:44:36	-28.09
PRMLxT1L	2020-02-26 09:05:52	-27.97
PRMLxT1L	2020-02-12 14:56:47	-28.14
PRMLxT1L	2020-02-12 14:35:25	-28.06
PRMLxT1L	2020-02-12 14:22:03	-28.08
PRMLxT1L	2020-01-31 10:37:34	-28.15
PRMLxT1L	2020-01-29 09:40:48	-28.13
PRMLxT1L	2020-01-15 11:51:04	-28.02

Summary- ST 2

File Name on Meter	LxT_Data.057.s
File Name on PC	LxT_0003285-20210204 122000-LxT_Data.057.ldbi
Serial Number	0003285
Model	SoundTrack LxT®
Firmware Version	2.302
User	
Location	
Job Description	
Note	

Measurement

Description	
Start	2021-02-04 12:20:00
Stop	2021-02-04 12:35:00
Duration	00:15:00.7
Run Time	00:15:00.7
Pause	00:00:00.0
Pre-Calibration	2021-02-04 12:16:45
Post-Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting		
Peak Weight	A Weighting		
Detector	Slow		
Preamplifier	PRMLxT1L		
Microphone Correction	Off		
Integration Method	Linear		
Overload	121.8 dB		
	A	**C**	**Z**
Under Range Peak	**78.1**	75.1	80.1
Under Range Limit	**26.1**	25.8	31.0
Noise Floor	16.4	16.7	21.8

Results

LA_{eq}	69.6		
LAE	99.2		
EA	915.036 µPa²h		
EA8	29.258 mPa²h		
EA40	146.292 mPa²h		
$LA_{peak\ (max)}$	2021-02-04 12:29:31	91.9	dB
LAS_{max}	2021-02-04 12:22:46	79.0	dB
LAS_{min}	2021-02-04 12:30:29	51.4	dB
SEA	-99.94 dB		

LAS > 85.0 dB (Exceedance Counts / Duration)	0	0.0 s
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0 s
LApeak > 135.0 dB (Exceedance Counts / Duration)	0	0.0 s
LApeak > 137.0 dB (Exceedance Counts / Duration)	0	0.0 s
LApeak > 140.0 dB (Exceedance Counts / Duration)	0	0.0 s

LCeq	76.0	dB
LAeq	69.6	dB
LCeq - LAeq	6.3	dB
LAIeq	71.4	dB
LAeq	69.6	dB
LAIeq - LAeq	1.8	dB

	A		
	dB	**Time Stamp**	**dB**
Leq	69.6		76.0
LS(max)	79.0	2021/02/04 12:22:46	
LS(min)	51.4	2021/02/04 12:30:29	
LPeak(max)	91.9	2021/02/04 12:29:31	

Overload Count	0	
Overload Duration	0.0	s

Dose Settings

Dose Name	OSHA-1	OSHA-2	
Exchange Rate	5	3	dB
Threshold	90	80	dB
Criterion Level	90	90	dB
Criterion Duration	8	8	h

Results

Dose	0.16	0.03	%
Projected Dose	5.24	0.91	%
TWA (Projected)	68.7	69.6	dB
TWA (t)	43.7	54.6	dB
Lep (t)	54.6	54.6	dB

Statistics

LAI5.00	74.8	dB
LAI10.00	73.7	dB
LAI33.30	69.5	dB
LAI50.00	67.4	dB
LAI66.60	65.4	dB
LAI90.00	60.4	dB

Calibration History

Preamp	**Date**	**dB re. 1V/Pa**
PRMLxT1L	2021-02-04 12:16:45	-28.10

PRMLxT1L	2021-02-03 15:31:03	-28.14
PRMLxT1L	2020-04-23 12:50:26	-27.93
PRMLxT1L	2020-02-27 05:51:17	-28.11
PRMLxT1L	2020-02-26 09:44:36	-28.09
PRMLxT1L	2020-02-26 09:05:52	-27.97
PRMLxT1L	2020-02-12 14:56:47	-28.14
PRMLxT1L	2020-02-12 14:35:25	-28.06
PRMLxT1L	2020-02-12 14:22:03	-28.08
PRMLxT1L	2020-01-31 10:37:34	-28.15
PRMLxT1L	2020-01-29 09:40:48	-28.13

Investigation Noise Calculations

Electrical Resistivity Imaging - Sledgehammer Use (Leq)

Location	Distance to Nearest Receptor in feet	Combined Predicted Noise Level (L_{eq} dBA)
Threshold	165	60.0
SR 1 (site UER-01)	8,335	14.5
SR 2	8,593	14.1

Equipment	Reference Emission Noise Levels (L_{max}) at 50 feet[1]	Usage Factor[1]
Sledgehammer	75.6	0.2
Pickup Truck	75	0.4

Ground Type	soft
Source Height	8
Receiver Height	5
Ground Factor[2]	0.63

Predicted Noise Level [3]	L_{eq} dBA at 50 feet[3]
Sledgehammer	68.6
Pickup Truck	71.0

Combined Predicted Noise Level (L_{eq} dBA at 50 feet)
73.0

Sources:

[1] Obtained from the FHWA Roadway Construction Noise Model, January 2006. Table 1.

[2] Based on Figure 6-5 from the Federal Transit Noise and Vibration Impact Assessment, 2006 (pg 6-23).

[3] Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006 (pg 12-3).

L_{eq}(equip) = E.L.+10*log (U.F.) - 20*log (D/50) - 10*G*log (D/50)

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects (FTA 2006: pg 6-23); and

D = Distance from source to receiver.

Seismic Refraction Investigations - Sledgehammer Use (Leq)

Location	Distance to Nearest Receptor in feet	Combined Predicted Noise Level (L_{eq} dBA)
Threshold	110	60.0
SR 1 (site DSR-22)	774	37.3
SR 2	786	37.1

Equipment	Reference Emission Noise Levels (L_{max}) at 50 feet[1]	Usage Factor[1]
Sledgehammer	75.6	0.2

Ground Type	soft
Source Height	8
Receiver Height	5
Ground Factor[2]	0.63

Predicted Noise Level [3]	L_{eq} dBA at 50 feet[3]
Sledgehammer	68.6

Combined Predicted Noise Level (L_{eq} dBA at 50 feet)
68.6

Sources:

[1] Obtained from the FHWA Roadway Construction Noise Model, January 2006. Table 1.

[2] Based on Figure 6-5 from the Federal Transit Noise and Vibration Impact Assessment, 2006 (pg 6-23).

[3] Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006 (pg 12-3).

L_{eq}(equip) = E.L.+10*log (U.F.) - 20*log (D/50) - 10*G*log (D/50)

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects (FTA 2006: pg 6-23); and

D = Distance from source to receiver.

Seismic Refraction Investigations - All Terrain Vehicle Use (Leq)

Location	Distance to Nearest Receptor in feet	Combined Predicted Noise Level (L_{eq} dBA)
Threshold	501	60.0
SR 1 (DSR 22)	774	53.7
SR 2 (DSR 22)	786	53.5
Access Rd to SR 3	675	55.2
SR 3 (site A-20-101)	794	53.4

Equipment	Reference Emission Noise Levels (L_{max}) at 50 feet[1]	Usage Factor[1]
All Terrain Vehicle	89	0.4

Ground Type	soft
Source Height	8
Receiver Height	5
Ground Factor[2]	0.63

Predicted Noise Level [3]	L_{eq} dBA at 50 feet[3]
All Terrain Vehicle	85.0

Combined Predicted Noise Level (L_{eq} dBA at 50 feet)
85.0

Sources:

[1] Obtained from the FHWA Roadway Construction Noise Model, January 2006. Table 1.

[2] Based on Figure 6-5 from the Federal Transit Noise and Vibration Impact Assessment, 2006 (pg 6-23).

[3] Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006 (pg 12-3).

L_{eq}(equip) = E.L.+10*log (U.F.) - 20*log (D/50) - 10*G*log (D/50)

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects (FTA 2006: pg 6-23); and

D = Distance from source to receiver.

Exploratory Test Pits (Leq)

Location	Distance to Nearest Receptor in feet	Combined Predicted Noise Level (L_{eq} dBA)
Threshold	262	60.0
SR 1 (site TP-19)	627	49.1
SR 2 (site TP-23)	741	47.2

Equipment	Reference Emission Noise Levels (L_{max}) at 50 feet[1]	Usage Factor[1]
Excavator	81	0.4
Pickup Truck	75	0.4

Ground Type	soft
Source Height	8
Receiver Height	5
Ground Factor[2]	0.63

Predicted Noise Level [3]	L_{eq} dBA at 50 feet[3]
Excavator	77.0
Pickup Truck	71.0

Combined Predicted Noise Level (L_{eq} dBA at 50 feet)
78.0

Sources:

[1] Obtained from the FHWA Roadway Construction Noise Model, January 2006. Table 1.

[2] Based on Figure 6-5 from the Federal Transit Noise and Vibration Impact Assessment, 2006 (pg 6-23).

[3] Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006 (pg 12-3).

L_{eq}(equip) = E.L.+10*log (U.F.) - 20*log (D/50) - 10*G*log (D/50)

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects (FTA 2006: pg 6-23); and

D = Distance from source to receiver.

Exploratory Boring - One Truck / ATV Rig (Leq)

Location	Distance to Nearest Receptor in feet	Combined Predicted Noise Level (L_{eq} dBA)
Commercial Threshold	143	70.0
Residential Threshold	359	60.0
SR 4 (PB-02)	240	63.5
SR 3 (A-20-104)	435	56.7
SR 1 (Site CB-21)	610	52.8
SR 2	1,365	43.6
SR 5 (site PB -02)	964	47.6

Equipment	Reference Emission Noise Levels (L_{max}) at 50 feet[1]	Usage Factor[1]
Auger Drill Rig	84	0.2
Pumps	81	0.5
Pickup Truck	75	0.4
Pickup Truck	75	0.4

Ground Type	soft
Source Height	8
Receiver Height	5
Ground Factor[2]	0.63

Predicted Noise Level [3]	L_{eq} dBA at 50 feet[3]
Auger Drill Rig	77.0
Pumps	78.0
Pickup Truck	71.0
Pickup Truck	71.0

Combined Predicted Noise Level (L_{eq} dBA at 50 feet)
81.4

Sources:

[1] Obtained from the FHWA Roadway Construction Noise Model, January 2006. Table 1.

[2] Based on Figure 6-5 from the Federal Transit Noise and Vibration Impact Assessment, 2006 (pg 6-23).

[3] Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006 (pg 12-3).

$L_{eq}(equip) = E.L.+10*\log(U.F.) - 20*\log(D/50) - 10*G*\log(D/50)$

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects (FTA 2006: pg 6-23); and

D = Distance from source to receiver.

Exploratory Boring - 3 drill rigs

Location	Distance to Nearest Receptor in feet	Combined Predicted Noise Level (L_{eq} dBA)
Threshold	428	60.0
SR 1 (site CB-20)	794	51.7

Equipment	Reference Emission Noise Levels (L_{max}) at 50 feet[1]	Usage Factor[1]
Rock Drill	81	0.2
Auger Drill Rig	84	0.2
Auger Drill Rig	84	0.2
Pumps	81	0.5
Pickup Truck	75	0.4
Pickup Truck	75	0.4

Ground Type	soft
Source Height	8
Receiver Height	5
Ground Factor[2]	0.63

Predicted Noise Level[3]	L_{eq} dBA at 50 feet[3]
Rock Drill	74.0
Auger Drill Rig	77.0
Auger Drill Rig	77.0
Pumps	78.0
Pickup Truck	71.0
Pickup Truck	71.0

Combined Predicted Noise Level (L_{eq} dBA at 50 feet)
83.3

Sources:

[1] Obtained from the FHWA Roadway Construction Noise Model, January 2006. Table 1.

[2] Based on Figure 6-5 from the Federal Transit Noise and Vibration Impact Assessment, 2006 (pg 6-23).

[3] Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006 (pg 12-3).

$L_{eq}(equip) = E.L.+10*\log(U.F.) - 20*\log(D/50) - 10*G*\log(D/50)$

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects (FTA 2006: pg 6-23); and

D = Distance from source to receiver.

Exploratory Boring - Helicopter Rig

Location	Distance to Nearest Receptor in feet	Combined Predicted Noise Level (L_{eq} dBA)
Threshold	433	60.0
SR 1	5,800	29.1

Equipment	Reference Emission Noise Levels (L_{max}) at 50 feet[1]	Usage Factor[1]
Pneumatic Tools	85	0.5
Pickup Truck	75	0.4
Chain Saw	84	0.2

Ground Type	soft
Source Height	8
Receiver Height	5
Ground Factor[2]	0.63

Predicted Noise Level [3]	L_{eq} dBA at 50 feet[3]
Pneumatic Tools	82.0
Pickup Truck	71.0
Chain Saw	77.0

Combined Predicted Noise Level (L_{eq} dBA at 50 feet)
83.4

Sources:

[1] Obtained from the FHWA Roadway Construction Noise Model, January 2006. Table 1.

[2] Based on Figure 6-5 from the Federal Transit Noise and Vibration Impact Assessment, 2006 (pg 6-23).

[3] Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006 (pg 12-3).

$L_{eq}(equip) = E.L.+10*\log(U.F.) - 20*\log(D/50) - 10*G*\log(D/50)$

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects (FTA 2006: pg 6-23); and

D = Distance from source to receiver.

Exploratory Boring - Barge-Based

Location	Distance to Nearest Receptor in feet	Combined Predicted Noise Level (L_{eq} dBA)
Threshold	448	60.0
SR 1	1,800	42.8

Equipment	Reference Emission Noise Levels (L_{max}) at 50 feet[1]	Usage Factor[1]
Auger Drill Rig	84	0.2
Pumps	81	0.5
motorboat (outboard)	85	0.4

Ground Type	soft
Source Height	8
Receiver Height	5
Ground Factor[2]	0.63

Predicted Noise Level [3]	L_{eq} dBA at 50 feet[3]
Auger Drill Rig	77.0
Pumps	78.0
motorboat (outboard)	81.0

Combined Predicted Noise Level (L_{eq} dBA at 50 feet)
83.8

Sources:

[1] Obtained from the FHWA Roadway Construction Noise Model, January 2006. Table 1.

[2] Based on Figure 6-5 from the Federal Transit Noise and Vibration Impact Assessment, 2006 (pg 6-23).

[3] Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006 (pg 12-3).

L_{eq}(equip) = E.L.+10*log (U.F.) - 20*log (D/50) - 10*G*log (D/50)

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects (FTA 2006: pg 6-23); and

D = Distance from source to receiver.

Attenuation Calculations for Stationary Noise Sources

KEY: Orange cells are for input.
Grey cells are intermediate calculations performed by the model.
Green cells are data to present in a written analysis (output).

STEP 1: Identify the noise source and enter the reference noise level (dBA and distance).

STEP 2: Select the ground type (hard or soft), and enter the source and receiver heights.

STEP 3: Select the distance to the receiver.

Noise Source/ID	Reference Noise Level			Attenuation Characteristics				Attenuated Noise Level at Receptor		
	noise level (dBA)	@	distance (ft)	Ground Type (soft/hard)	Source Height (ft)	Receiver Height (ft)	Ground Factor	noise level (dBA)	@	distance (ft)
Sledgehammer - Electrical Resistivity	108.0	@	3	soft	6	5	0.65	75.6	@	50
Helicopter (Lmax) takeoff	97.2	@	100	soft	6	5	0.65	79.9	@	450
Helicopter (Lmax) landing	98.1	@	100	soft	6	5	0.65	79.9	@	485
ATV (pass by) - Threshold	89.0	@	50	soft	6	5	0.65	60.0	@	622
ATV (pass by) - SR-3	89.0	@	50	soft	6	5	0.65	57.2	@	794
ATV (pass by) - Access road to SR 3	89.0	@	50	soft	6	5	0.65	59.0	@	675
Test Pit Noise at SR 2	78.5	@	50	soft	6	5	0.65	48.3	@	690
Exploratory Boring - 1 Rig Noise at SR 5	81.0	@	50	soft	6	5	0.65	46.9	@	964

Notes: AGL = above ground level; ATV = alternative terrain vehicle
Estimates of attenuated noise levels do not account for reductions from intervening barriers, including walls, trees, vegetation, or structures of any type.

Computation of the attenuated noise level is based on the equation presented on pg. 12-3 and 12-4 of FTA 2006.

Computation of the ground factor is based on the equation presentd in Figure 6-23 on pg. 6-23 of FTA 2006, where the distance of the reference noise leve can be adjusted and the usage factor is not applied (i.e., the usage factor is equal to 1).

Sources:

Federal Transit Association (FTA). 2006 (May). Transit Noise and Vibration Impact Assessment. FTA-VA-90-1003-06. Washington, D.C. Available: <http://www.fta.dot.gov/documents/FTA_Noise_and_Vibration_Manual.pdf>. Accessed: September 24, 2010.

Nighttime Investigation (Site R-20-001/003)

Location	Distance to Nearest Receptor in feet	Combined Predicted Noise Level (L_{eq} dBA)
Threshold	461	50.0
SR 3 Property Line (site 003)	225	56.9
SR 3 Property Line (site 001)	295	53.8

Equipment	Reference Emission Noise Levels (L_{max}) at 50 feet[1]	Usage Factor[1]
Drill Rig Truck	79	0.2
Generator (<25KVA, VMS signs)	73	0.5

Ground Type	soft
Source Height	8
Receiver Height	5
Ground Factor[2]	0.63

Predicted Noise Level [3]	L_{eq} dBA at 50 feet[3]
Drill Rig Truck	72.0
Generator (<25KVA, VMS signs)	70.0

Combined Predicted Noise Level (L_{eq} dBA at 50 feet)
74.1

Sources:

[1] Obtained from the FHWA Roadway Construction Noise Model, January 2006. Table 1.

[2] Based on Figure 6-5 from the Federal Transit Noise and Vibration Impact Assessment, 2006 (pg 6-23).

[3] Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006 (pg 12-3).

$L_{eq}(equip) = E.L.+10*\log(U.F.) - 20*\log(D/50) - 10*G*\log(D/50)$

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects (FTA 2006: pg 6-23); and

D = Distance from source to receiver.

Temporary Increase in Noise Calculations: Daytime Activities

	Noise Level		Adjusted for Ground Type					
	dBA Leq	FT	*(existing noise at SR)*		Activity Noise at SR	Combined (Existing + Project)	Change	Threshold
Reference Noise Level (HWY 152)[1]	69.6	100						
Calculated noise level	72.6	50						
SR 1	60.4	840	52.6	840	53.7	56.2	3.6	10
SR 2	62.4	520	56.0	520	53.5	57.9	1.9	10
SR 3	63.1	450	57.0	450	56.7	59.9	2.9	10
SR 4	67.8	150	64.8	150	63.5	67.2	2.4	10
SR 5	60.1	900	52.1	900	47.6	53.4	1.3	10

Sources

Attenuation Formula (line source)

Lp(R2)=Lp(R1)-10*Log(R2/R1)

			source height	8
Lp(R1)	=	reference noise level at known distance	receiver height	5
Lp(R2)	=	noise level at second location	ground type	soft
R1	=	reference level distance		6.5
R2	=	distance to second location		
			ground factor	0.6339286

1. Short-term Leq measurement conducted 100 feet from the centerline of HWY 152

Temporary Increase in Noise Calculations: Nighttime Activities

	Noise Level dBA Leq	Activity Noise at SR	Combined (Existing + Project)	Change	Threshold
Reference Noise Level (HWY 152)[1]	**59.9**				
	Existing Noise (dBA Leq) at SR-3				
Site R-20-003	**59.9**	56.9	61.7	1.8	10
Site R-20-001	**59.9**	53.8	60.9	1.0	10
Mitigation Site 003	**59.9**	49.9	60.3	0.4	10
Mitigation Site 001	**59.9**	49.8	60.3	0.4	10

Sources

Attenuation Formula (line source)

Lp(R2)=Lp(R1)-10*Log(R2/R1)

Lp(R1)	=	reference noise level at known distance
Lp(R2)	=	noise level at second location
R1	=	reference level distance
R2	=	distance to second location

1. LT2 24-hr measurement (4/25/2024-4/26/2024) used to calculate nighttime (7pm-7am) 12-hr Leq. See Calculation Sheet: 12-Hour Leq Calculator

Equipment Description	Acoustical Usage Factor (%)	Spec 721.560 Lmax @ 50ft (dBA slow)	Actual Measured Lmax @ 50ft (dBA slow)	No. of Actual Data Samples (count)	Spec 721.560 LmaxCalc	Spec 721.560 Leq	Distance	Actual Measured LmaxCalc	Actual Measured Leq
Auger Drill Rig	20	85	84	36	79.0	72.0	100	78.0	71.0
Backhoe	40	80	78	372	74.0	70.0	100	72.0	68.0
Bar Bender	20	80	na	0	74.0	67.0	100		
Blasting	na	94	na	0	88.0		100		
Boring Jack Power Unit	50	80	83	1	74.0	71.0	100	77.0	74.0
Chain Saw	20	85	84	46	79.0	72.0	100	78.0	71.0
Clam Shovel (dropping)	20	93	87	4	87.0	80.0	100	81.0	74.0
Compactor (ground)	20	80	83	57	74.0	67.0	100	77.0	70.0
Compressor (air)	40	80	78	18	74.0	70.0	100	72.0	68.0
Concrete Batch Plant	15	83	na	0	77.0	68.7	100		
Concrete Mixer Truck	40	85	79	40	79.0	75.0	100	73.0	69.0
Concrete Pump Truck	20	82	81	30	76.0	69.0	100	75.0	68.0
Concrete Saw	20	90	90	55	84.0	77.0	100	84.0	77.0
Crane	16	85	81	405	79.0	71.0	100	75.0	67.0
Dozer	40	85	82	55	79.0	75.0	100	76.0	72.0
Drill Rig Truck	20	84	79	22	78.0	71.0	100	73.0	66.0
Drum Mixer	50	80	80	1	74.0	71.0	100	74.0	71.0
Dump Truck	40	84	76	31	78.0	74.0	100	70.0	66.0
Excavator	40	85	81	170	79.0	75.0	100	75.0	71.0
Flat Bed Truck	40	84	74	4	78.0	74.0	100	68.0	64.0
Front End Loader	40	80	79	96	74.0	70.0	100	73.0	69.0
Generator	50	82	81	19	76.0	73.0	100	75.0	72.0
Generator (<25KVA, VMS signs)	50	70	73	74	64.0	61.0	100	67.0	64.0
Gradall	40	85	83	70	79.0	75.0	100	77.0	73.0
Grader	40	85	na	0	79.0	75.0	100		
Grapple (on Backhoe)	40	85	87	1	79.0	75.0	100	81.0	77.0
Horizontal Boring Hydr. Jack	25	80	82	6	74.0	68.0	100	76.0	70.0
Hydra Break Ram	10	90	na	0	84.0	74.0	100		
Impact Pile Driver	20	95	101	11	89.0	82.0	100	95.0	88.0
Jackhammer	20	85	89	133	79.0	72.0	100	83.0	76.0
Man Lift	20	85	75	23	79.0	72.0	100	69.0	62.0
Mounted Impact Hammer (hoe ram)	20	90	90	212	84.0	77.0	100	84.0	77.0
Pavement Scarafier	20	85	90	2	79.0	72.0	100	84.0	77.0
Paver	50	85	77	9	79.0	76.0	100	71.0	68.0
Pickup Truck	40	55	75	1	49.0	45.0	100	69.0	65.0
Pneumatic Tools	50	85	85	90	79.0	76.0	100	79.0	76.0
Pumps	50	77	81	17	71.0	68.0	100	75.0	72.0
Refrigerator Unit	100	82	73	3	76.0	76.0	100	67.0	67.0
Rivit Buster/chipping gun	20	85	79	19	79.0	72.0	100	73.0	66.0
Rock Drill	20	85	81	3	79.0	72.0	100	75.0	68.0
Roller	20	85	80	16	79.0	72.0	100	74.0	67.0
Sand Blasting (Single Nozzle)	20	85	96	9	79.0	72.0	100	90.0	83.0
Scraper	40	85	84	12	79.0	75.0	100	78.0	74.0
Shears (on backhoe)	40	85	96	5	79.0	75.0	100	90.0	86.0
Slurry Plant	100	78	78	1	72.0	72.0	100	72.0	72.0
Slurry Trenching Machine	50	82	80	75	76.0	73.0	100	74.0	71.0
Soil Mix Drill Rig	50	80	na	0	74.0	71.0	100		
Tractor	40	84	na	0	78.0	74.0	100		
Vacuum Excavator (Vac-truck)	40	85	85	149	79.0	75.0	100	79.0	75.0
Vacuum Street Sweeper	10	80	82	19	74.0	64.0	100	76.0	66.0
Ventilation Fan	100	85	79	13	79.0	79.0	100	73.0	73.0
Vibrating Hopper	50	85	87	1	79.0	76.0	100	81.0	78.0
Vibratory Concrete Mixer	20	80	80	1	74.0	67.0	100	74.0	67.0
Vibratory Pile Driver	20	95	101	44	89.0	82.0	100	95.0	88.0
Warning Horn	5	85	83	12	79.0	66.0	100	77.0	64.0
Welder / Torch	40	73	74	5	67.0	63.0	100	68.0	64.0

Source:
FHWA Roadway Construction Noise Model, January 2006. Table 9.1
U.S. Department of Transportation
CA/T Construction Spec. 721.560

Investigation Vibration Calculation

Distance Propagation Calculations for Stationary Sources of Ground Vibration

KEY: Orange cells are for input.
Grey cells are intermediate calculations performed by the model.
Green cells are data to present in a written analysis (output).

STEP 1: Determine units in which to perform calculation.

— If vibration decibels (VdB), then use Table A and proceed to Steps 2A and 3A.
— If peak particle velocity (PPV), then use Table B and proceed to Steps 2B and 3B.

STEP 2A: Identify the vibration source and enter the reference vibration level (VdB) and distance.

STEP 3A: Select the distance to the receiver.

Table A. Propagation of vibration decibels (VdB) with distance

Noise Source/ID	Reference Noise Level			Attenuated Noise Level at Receptor		
	vibration level (VdB)	@	distance (ft)	vibration level (VdB)	@	distance (ft)
vibratory roller	94	@	25	72.0	@	135
vibratory roller	94	@	25	53.4	@	563
caisson drilling	87	@	25	72.0	@	79
caisson drilling	87.0	@	25	62.8	@	160

The Lv metric (VdB) is used to assess the likelihood for vibration to result in human annoyance.

STEP 2B: Identify the vibration source and enter the reference peak particle velocity (PPV) and distance.

STEP 3B: Select the distance to the receiver.

Table B. Propagation of peak particle velocity (PPV) with distance

Noise Source/ID	Reference Noise Level			Attenuated Noise Level at Receptor		
	vibration level (PPV)	@	distance (ft)	vibration level (PPV)	@	distance (ft)
vibratory roller	0.210	@	25	0.198	@	26
vibratory roller	0.210	@	25	0.002	@	563
caisson drilling	0.089	@	25	0.191	@	15
caisson drilling	0.089	@	25	0.005	@	160

0.2 ppv

The PPV metric (in/sec) is used for assessing the likelihood for the potential of structural damage.

Notes:

Computation of propagated vibration levels is based on the equations presented on pg. 185 of FTA 2018. Estimates of attenuated vibration levels do not account for reductions from intervening underground barriers or other underground structures of any type, or changes in soil type.

Federal Transit Association (FTA). 2018 (September). Transit Noise and Vibration Impact Assessment Manual. FTA Report No. 0123. Washington, D.C. Accessed: December 20, 2020. Page Available: https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

Public Draft Initial Study/Mitigated Negative Declaration

Appendix H:

Native American Outreach Letters

DocuSign Envelope ID: 5FBB4E18-6BF5-46F8-8316-79EF89BC86AE

October 25, 2023

Valentin Lopez, Chair
Amah Mutsun Tribal Band
P.O. Box 5272
Galt, CA 95632

Sent Via U.S. Mail &
E-Mail: vlopez@amahmutsun.org

Subject: Notification of Decision to Propose Undertaking a Project, and Notification of Informal Consultation Opportunity.

Dear Chair Lopez,

The Santa Clara Valley Water District (Valley Water) is proposing to undertake the Design Level Geotechnical Investigations (proposed project) in support of the Pacheco Reservoir Expansion Project (PREP). This letter is to notify you of an informal consultation opportunity due to your consultation history with Valley Water regarding the PREP project.

Below please find a description of the proposed project location, a description of the proposed project, and the name of the project point of contact.

The proposed project is located within, adjacent to, and in the vicinity of the existing Pacheco Reservoir, and along State Route 152 (SR-152) from Kaiser-Aetna Road to the site entrance located approximately one mile east of Kaiser-Aetna Road on the north side of SR-152. Pacheco Reservoir is located along North Fork Pacheco Creek and behind North Fork Dam (near 37.05022, -121.291754), roughly equidistant between the cities of Gilroy and Los Banos. The existing reservoir is located approximately one-half mile north of SR-152 in eastern Santa Clara County, California (Figure 1).

The proposed project would consist of basic geotechnical investigations and survey data collection for information gathering purposes in support of PREP design. Valley Water proposes to conduct geotechnical investigations to include geotechnical borings, test pits, electrical resistivity surveys, and seismic refraction surveys. The proposed project would include investigations at multiple locations in the general vicinity of and within Pacheco Reservoir, and along the SR-152 corridor from Kaiser-Aetna Road to the site access. The investigations would include:

- Drilling 120 soil and rock borings within the existing reservoir and in upland areas (see attached Figures 2a – 2e). This would include the installation and monitoring of 25 piezometers and four inclinometers. These borings are intended to support design of the PREP site access road, shell borrow area, core borrow area, conveyance line, tunnel foundation, shaft foundation, pipeline foundation, pumpstation foundation, SR-152 interchange improvements, reservoir rim landslide, spillway foundation, dam foundation, outlet, and channel restoration.
- Implementing surface geophysical surveys to include 16,970 feet of seismic refraction survey lines and 1,530 feet of electrical resistivity survey lines. Surface geophysical surveys would only result in minor soil disturbance from the temporary placement of 1/2-inch diameter stainless-steel electrodes and stakes.
- Excavating 32 excavator test pits to explore a potential borrow area for dam core zone material. Test pits would generally be about 10 to 20 feet long, 3 feet wide and up to 20 feet deep.

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- Providing for equipment access via all-terrain track-mounted, truck mounted, trailer-mounted and barge based (if reservoir is inundated) drill rigs, and the placement and removal of rigs onto portable wooden work platforms via helicopter in steeper terrain.
- Drilling up to 30 supplemental soil and rock core borings that are assigned general locations. Supplemental borings are intended to fill in unforeseen data gaps that may still exist following completion of the initial design level geotechnical investigations, or where the results of design level investigations raise new questions or create new uncertainties.

Please notify me in writing if you would like to request an informal consultation with Valley Water regarding the proposed project. Should you have any questions, please contact me as Valley Water's point of contact for the proposed project:

Julianne O'Brien, Pacheco Project Delivery Unit Manager
Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, CA 95118
Direct Phone: (408) 630-2680
e-mail: JulianneOBrien@valleywater.org

Respectfully,

DocuSigned by:
Julianne M V O'Brien
7A1BCEDDC98143A...

10/25/2023

Julianne O'Brien
Pacheco Project Delivery Unit Manager

Attachments:
Figure 1: Design Level Geotechnical Investigations Project Location Map
Figures 2a–2e: Design Level Geotechnical Investigations Area of Potential Effects Map

Cc: Victor Gutierrez, Senior Engineer
Ryan McCarter, Deputy Operating Officer (Acting)
Todd Sexauer, Senior Environmental Planner

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Project Location Map
Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

Figure 1

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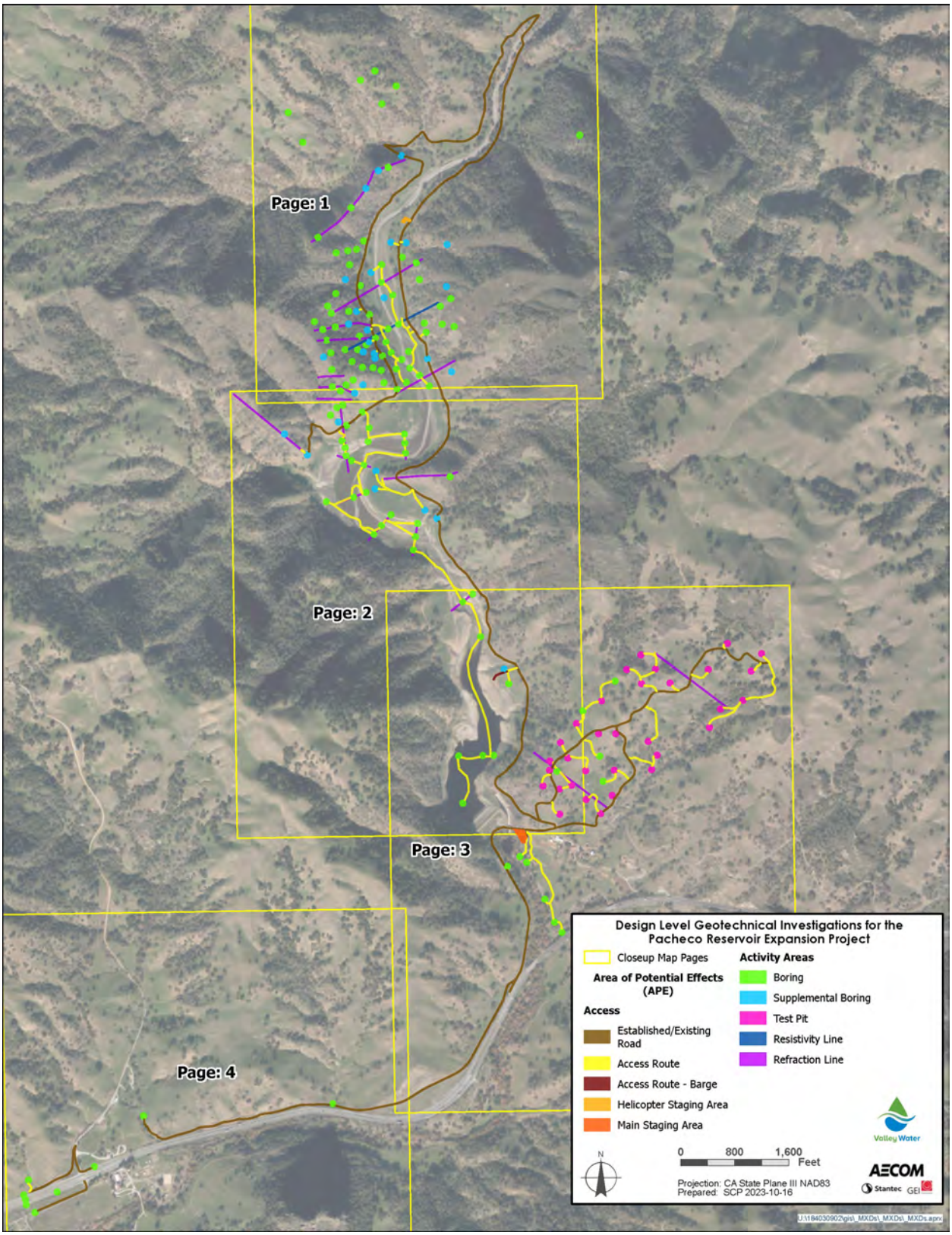

Area of Potential Effects - Index Map
Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

Figure 2a

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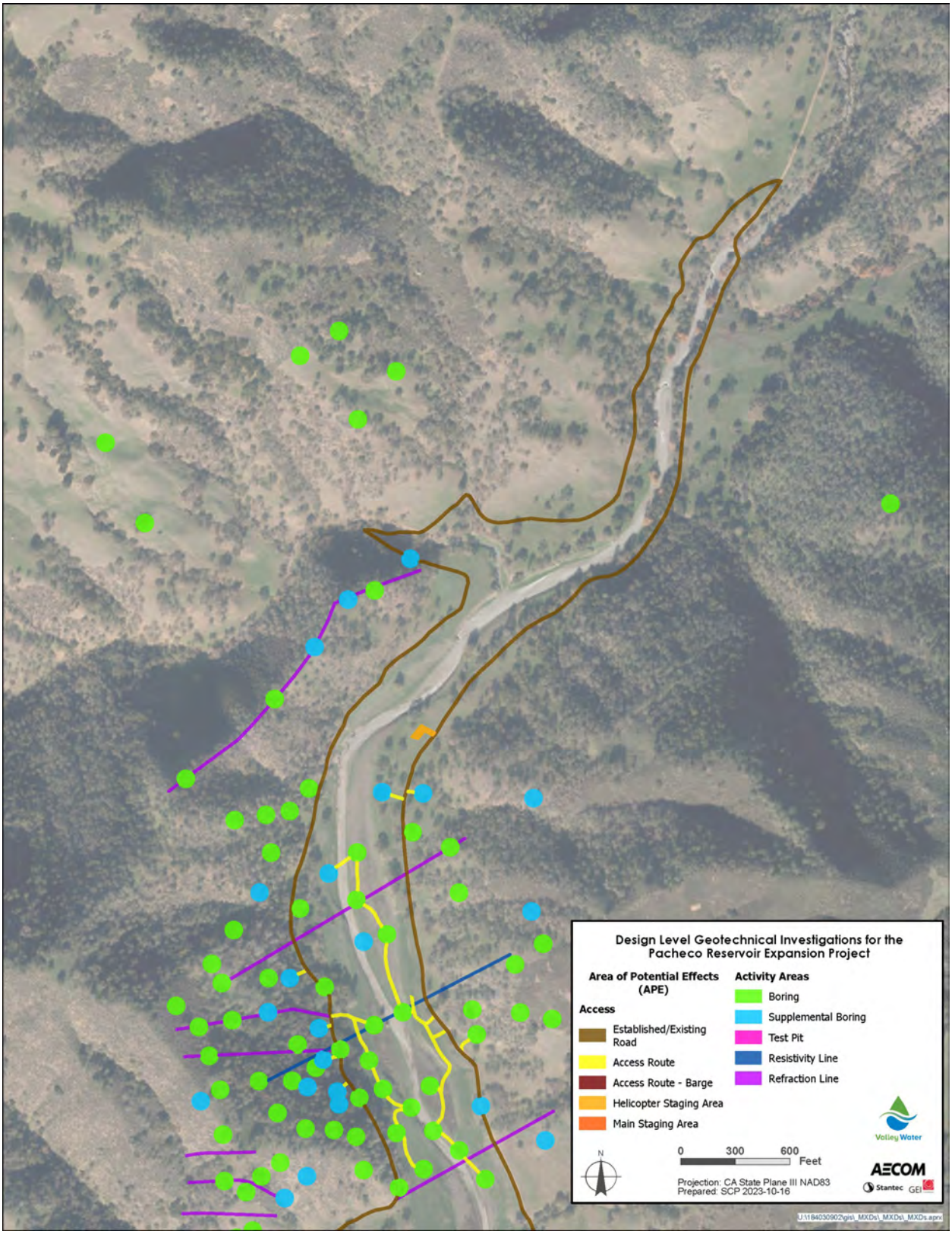

Figure 2b

Area of Potential Effects – Page 1

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

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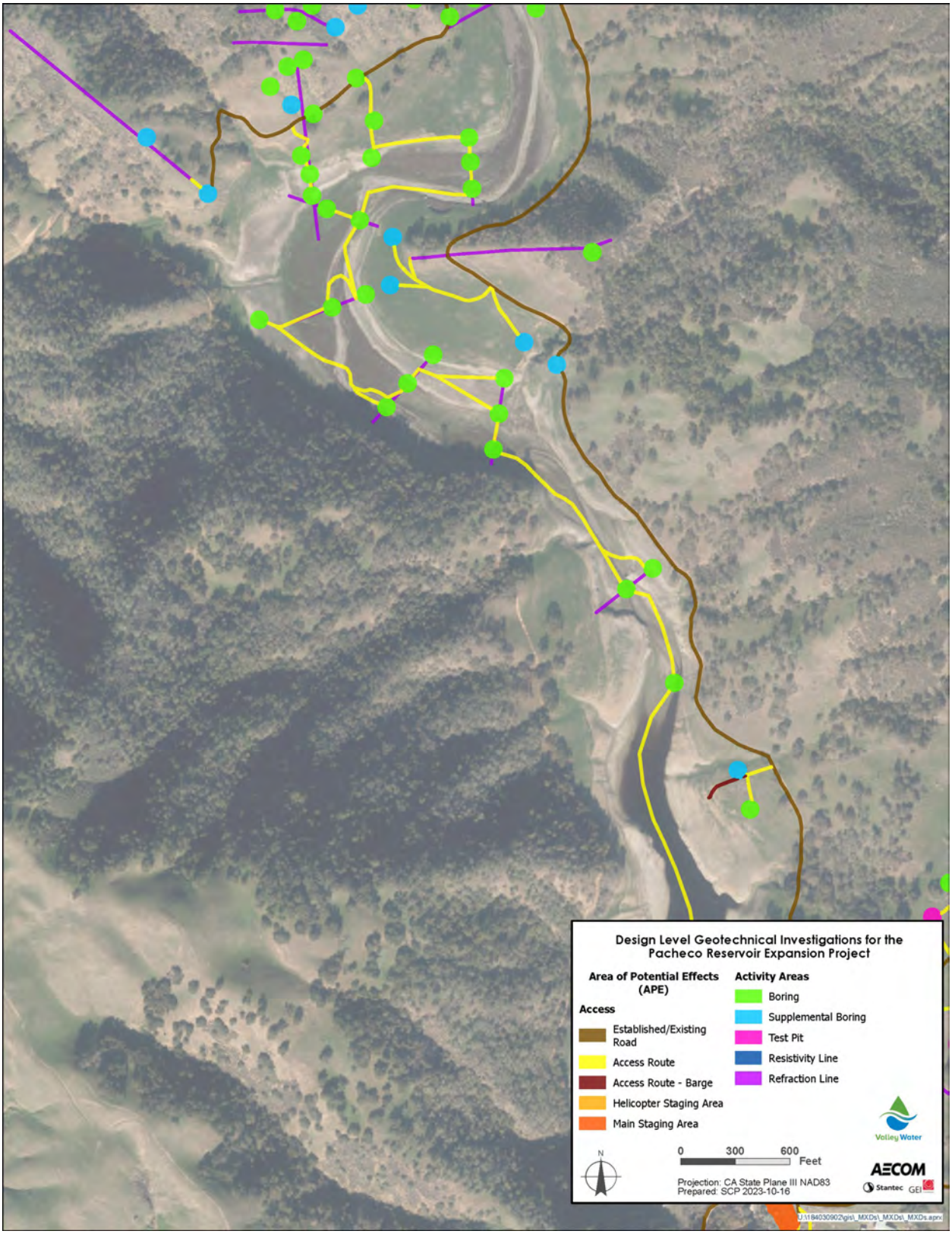

Area of Potential Effects – Page 2
Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

Figure 2c

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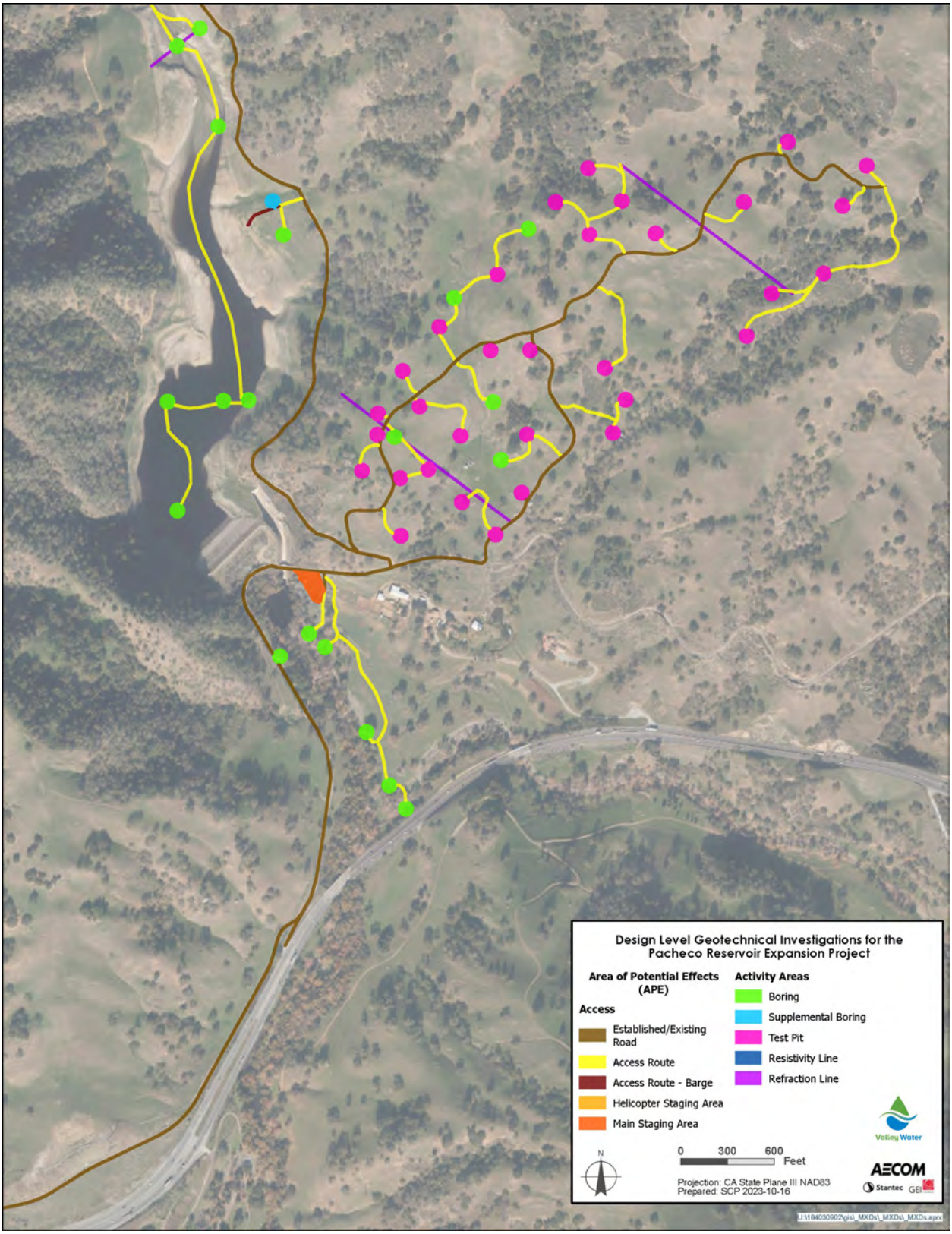

Area of Potential Effects – Page 3
Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

Figure 2d

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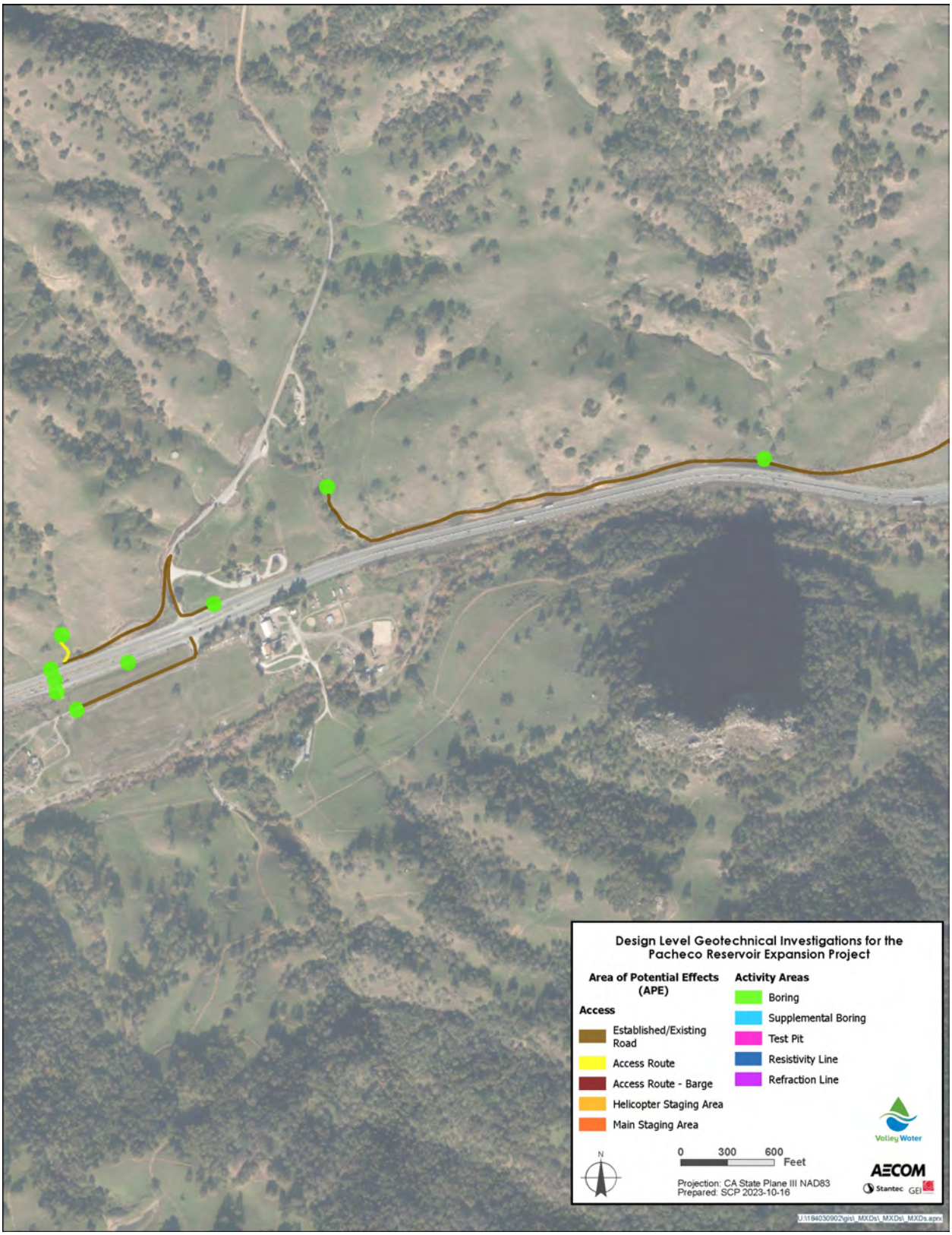

Area of Potential Effects – Page 4

Figure 2e

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

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October 25, 2023

Ms. Charlene Nijmeh, Tribal Chair
Muwekma Ohlone Indian Tribe
20885 Redwood Road, Suite 232
Castro Valley, CA 94546

Sent Via U.S. Mail &
E-Mail: cnijmeh@muwkma.org

Subject: Tribal Cultural Resources under the California Environmental Quality Act (CEQA), AB 52 (Gatto, 2014). Formal Notification of Decision to Propose Undertaking a Project, and Notification of Consultation Opportunity, pursuant to Public Resources Code §21080.3.1 (hereafter PRC).

Dear Ms. Nijmeh,

The Santa Clara Valley Water District (Valley Water) is proposing to undertake the Design Level Geotechnical Investigations (proposed project) in support of the Pacheco Reservoir Expansion Project (PREP). This letter is to formally notify you of a consultation opportunity pursuant to Public Resources Code (PRC) §21080.3.1.

Below please find a description of the Project location, a description of the proposed project, and the name of the project point of contact, pursuant to PRC §21080.3.1 (d).

The proposed project is located within, adjacent to, and in the vicinity of the existing Pacheco Reservoir, and along State Route 152 (SR-152) from Kaiser-Aetna Road to the site entrance located approximately one mile east of Kaiser-Aetna Road on the north side of SR-152. Pacheco Reservoir is located along North Fork Pacheco Creek and behind North Fork Dam (near 37.05022, -121.291754), roughly equidistant between the cities of Gilroy and Los Banos. The existing reservoir is located approximately one-half mile north of SR-152 in eastern Santa Clara County, California (Figure 1).

The proposed project would consist of basic geotechnical investigations and survey data collection for information gathering purposes in support of PREP design. Valley Water proposes to conduct geotechnical investigations to include geotechnical borings, test pits, electrical resistivity surveys, and seismic refraction surveys. The proposed project would include investigations at multiple locations in the general vicinity of and within Pacheco Reservoir, and along the SR-152 corridor from Kaiser-Aetna Road to the site access. The investigations would include:

- Drilling 120 soil and rock borings within the existing reservoir and in upland areas (see attached Figures 2a – 2e). This would include the installation and monitoring of 25 piezometers and four inclinometers. These borings are intended to support design of the PREP site access road, shell borrow area, core borrow area, conveyance line, tunnel foundation, shaft foundation, pipeline foundation, pumpstation foundation, temporary SR-152 site access improvements, reservoir rim landslide, spillway foundation, dam foundation, outlet, and channel restoration.
- Implementing surface geophysical surveys to include 16,970 feet of seismic refraction survey lines and 1,530 feet of electrical resistivity survey lines. Surface geophysical surveys would only result in minor soil disturbance from the temporary placement of 1/2-inch diameter stainless-steel electrodes and stakes.
- Excavating 32 excavator test pits to explore a potential borrow area for dam core zone material. Test pits would generally be about 10 to 20 feet long, 3 feet wide and up to 20 feet deep.

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- Providing for equipment access via all-terrain track-mounted, truck mounted, trailer-mounted and barge based (if reservoir is inundated) drill rigs, and the placement and removal of rigs onto portable wooden work platforms via helicopter in steeper terrain.
- Drilling up to 30 supplemental soil and rock core borings that are assigned general locations. Supplemental borings are intended to fill in unforeseen data gaps that may still exist following completion of the initial design level geotechnical investigations, or where the results of design level investigations raise new questions or create new uncertainties.

Pursuant to PRC §21080.3.1 (b), the Muwekma Ohlone Indian Tribe has 30 days from the receipt of this notification to request consultation with Valley Water in writing. Should you have any questions, please contact me as Valley Water's point of contact for the proposed project:

Julianne O'Brien, Pacheco Project Delivery Unit Manager
Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, CA 95118
Direct Phone: (408) 630-2680
e-mail: JulianneOBrien@valleywater.org

Respectfully,

DocuSigned by:
Julianne M V O'Brien
7A1BCEDDC98143A...

10/25/2023

Julianne O'Brien
Pacheco Project Delivery Unit Manager

Attachments:
Figure 1: Design Level Geotechnical Investigations Project Location Map
Figures 2a–2e: Design Level Geotechnical Investigations Area of Potential Effects Map

Cc: Victor Gutierrez, Senior Engineer
Ryan McCarter, Deputy Operating Officer (Acting)
Todd Sexauer, Senior Environmental Planner

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Project Location Map
Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

Figure 1

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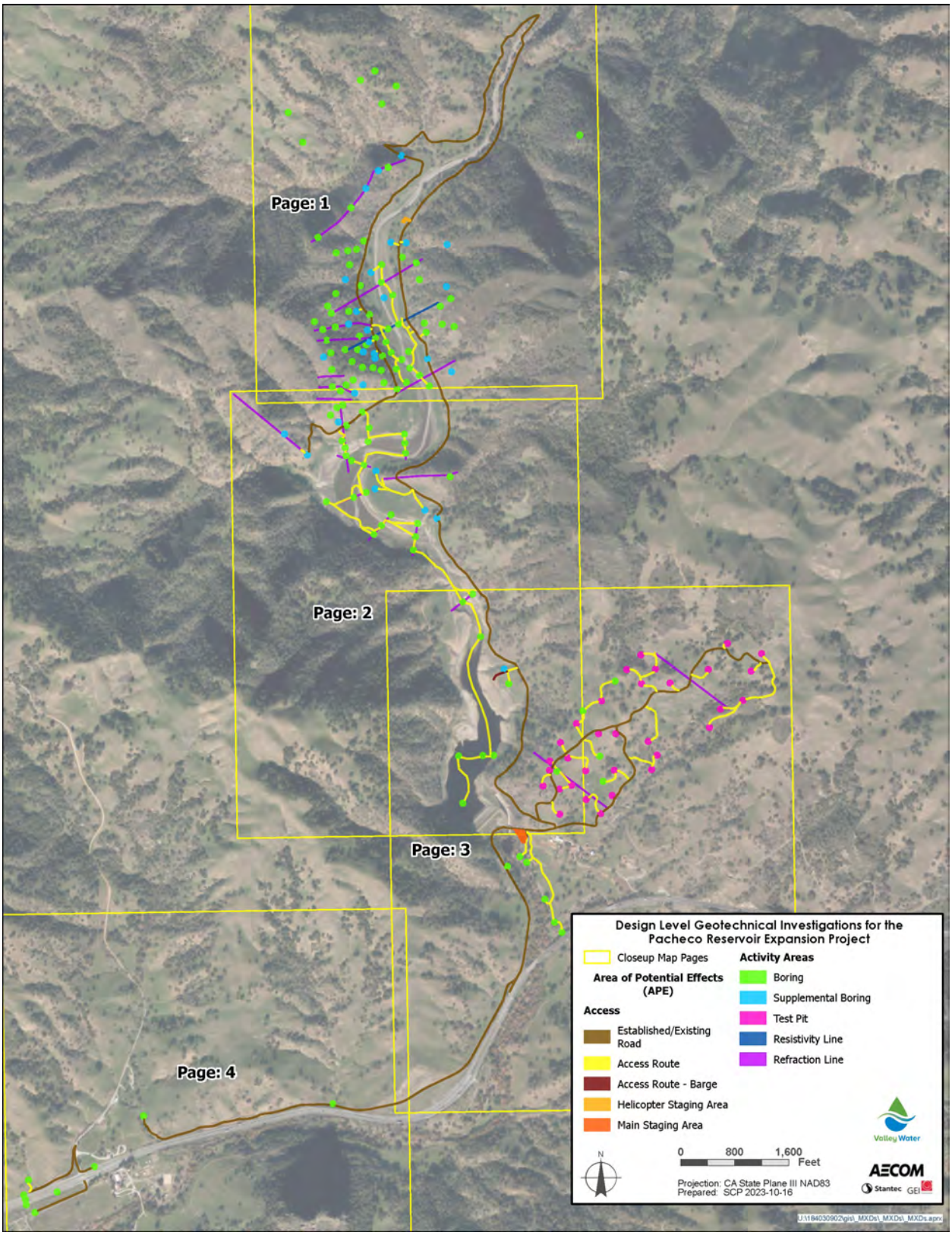

Area of Potential Effects - Index Map
Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

Figure 2a

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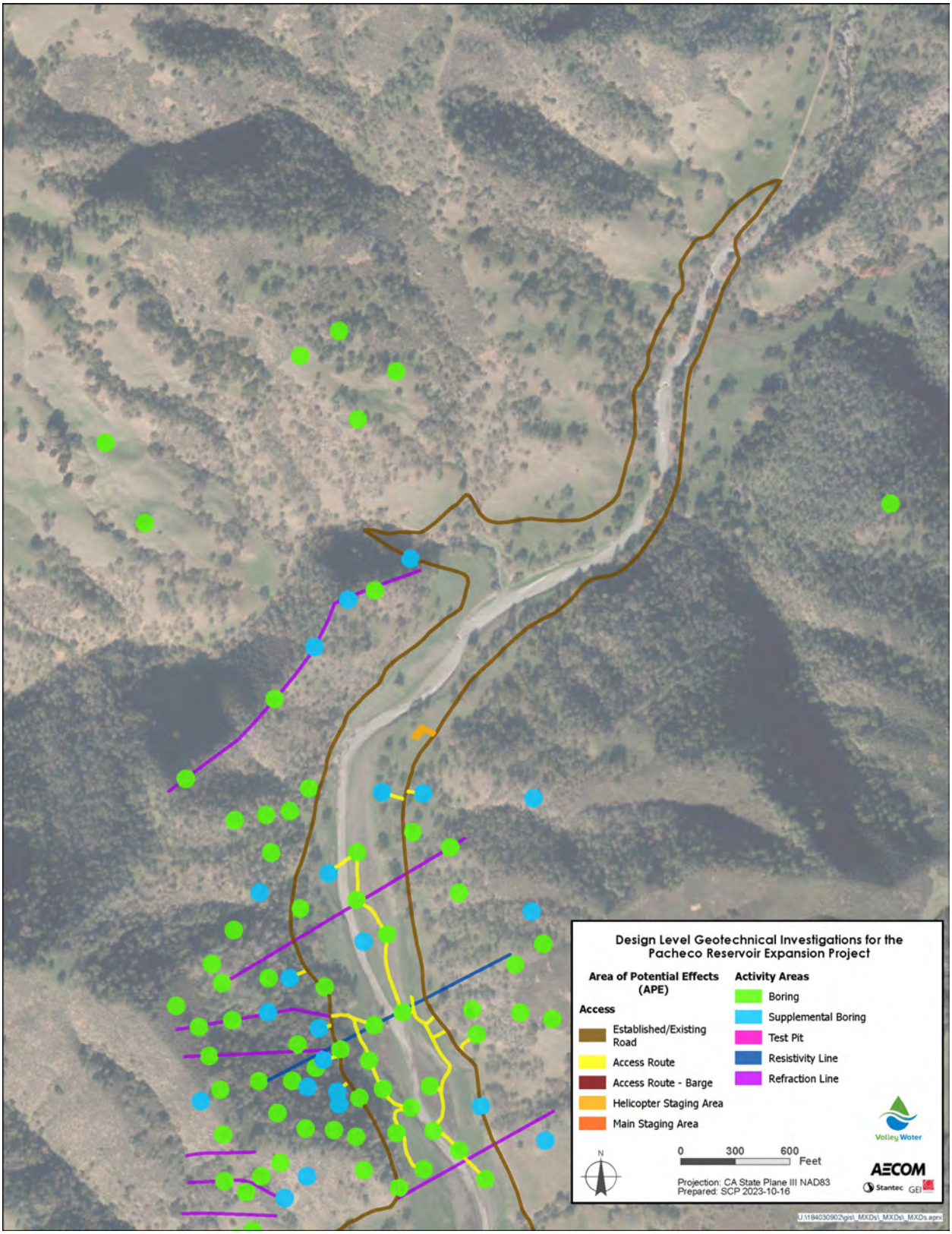

Figure 2b

Area of Potential Effects – Page 1

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

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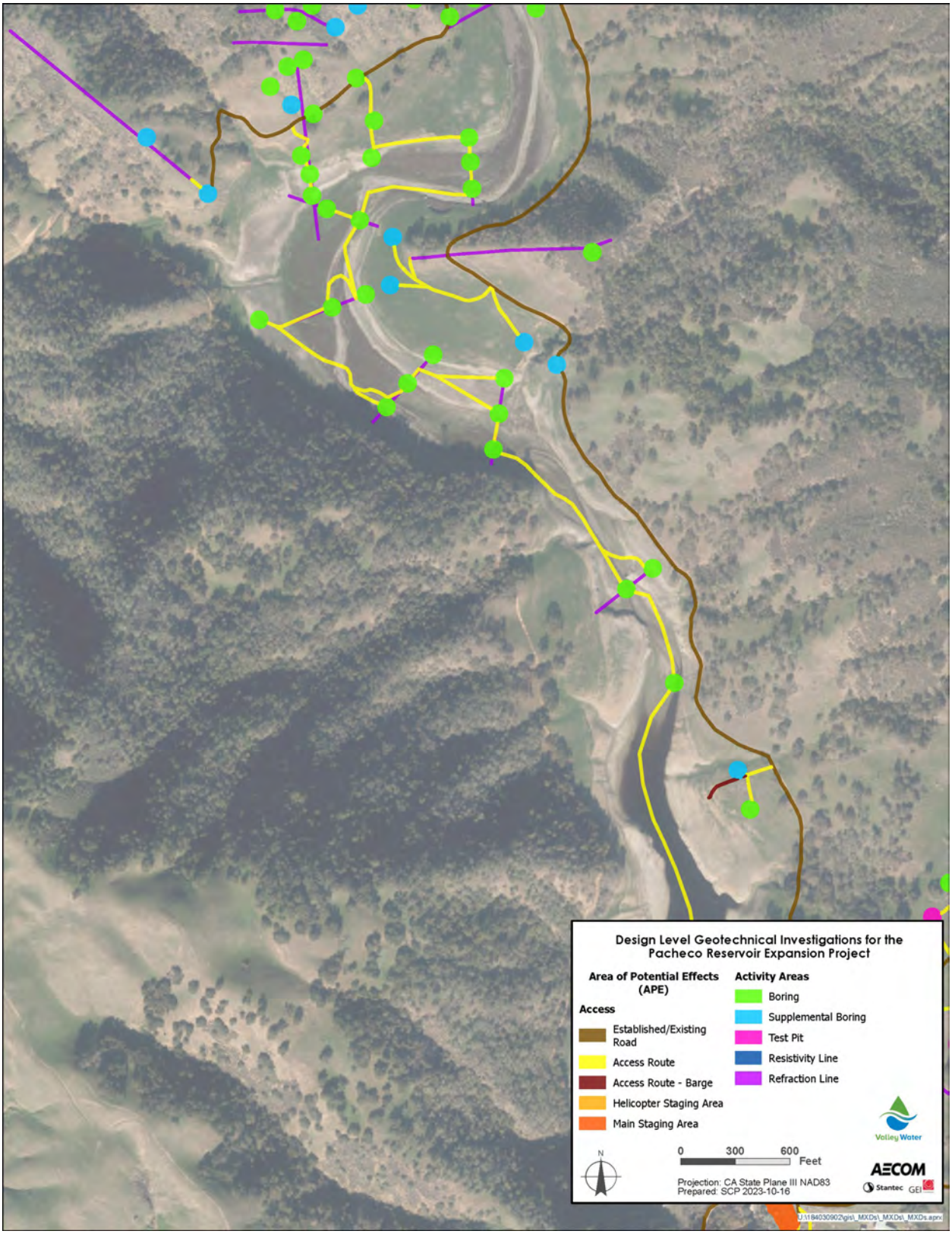

Area of Potential Effects – Page 2
Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

Figure 2c

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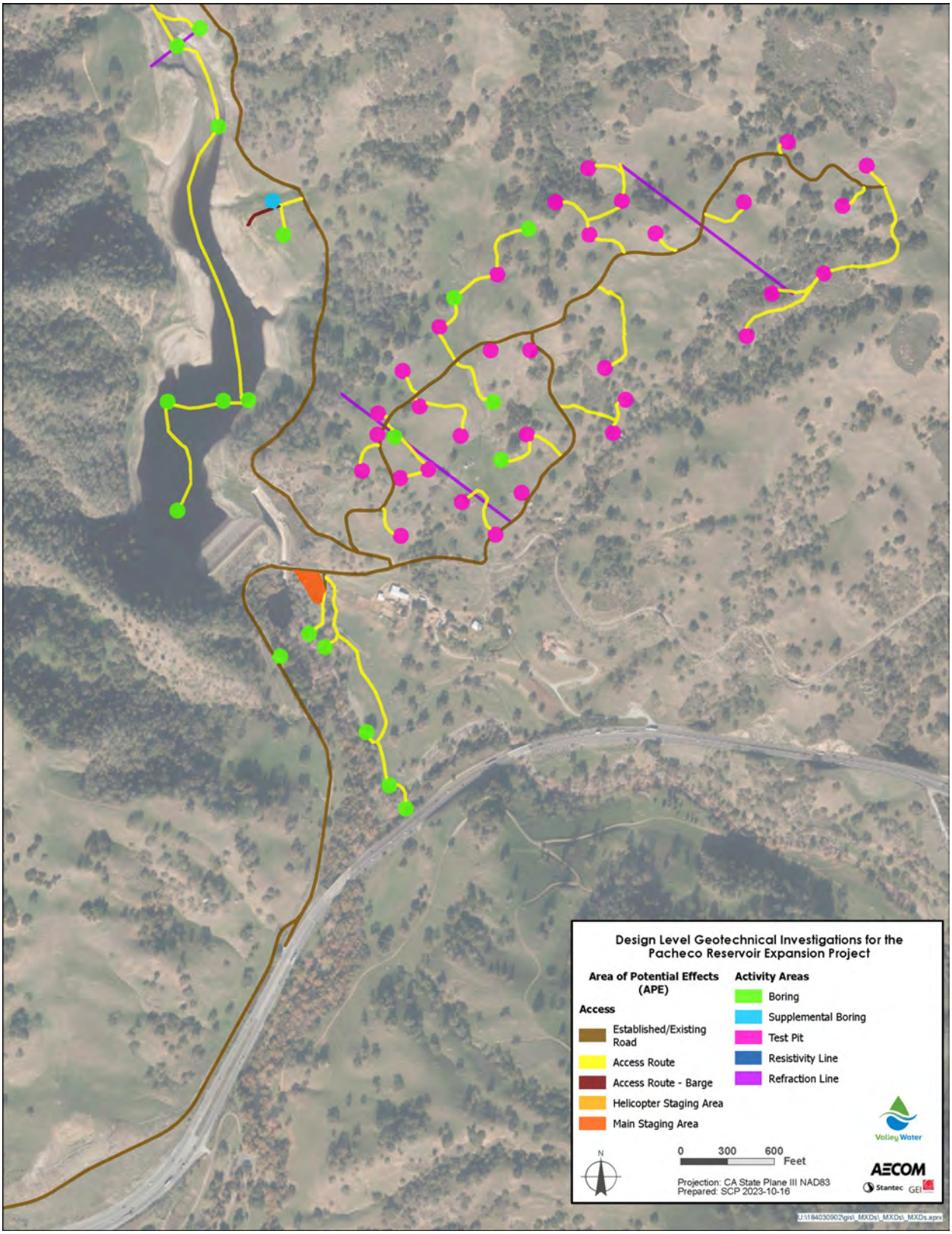

Area of Potential Effects – Page 3
Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

Figure 2d

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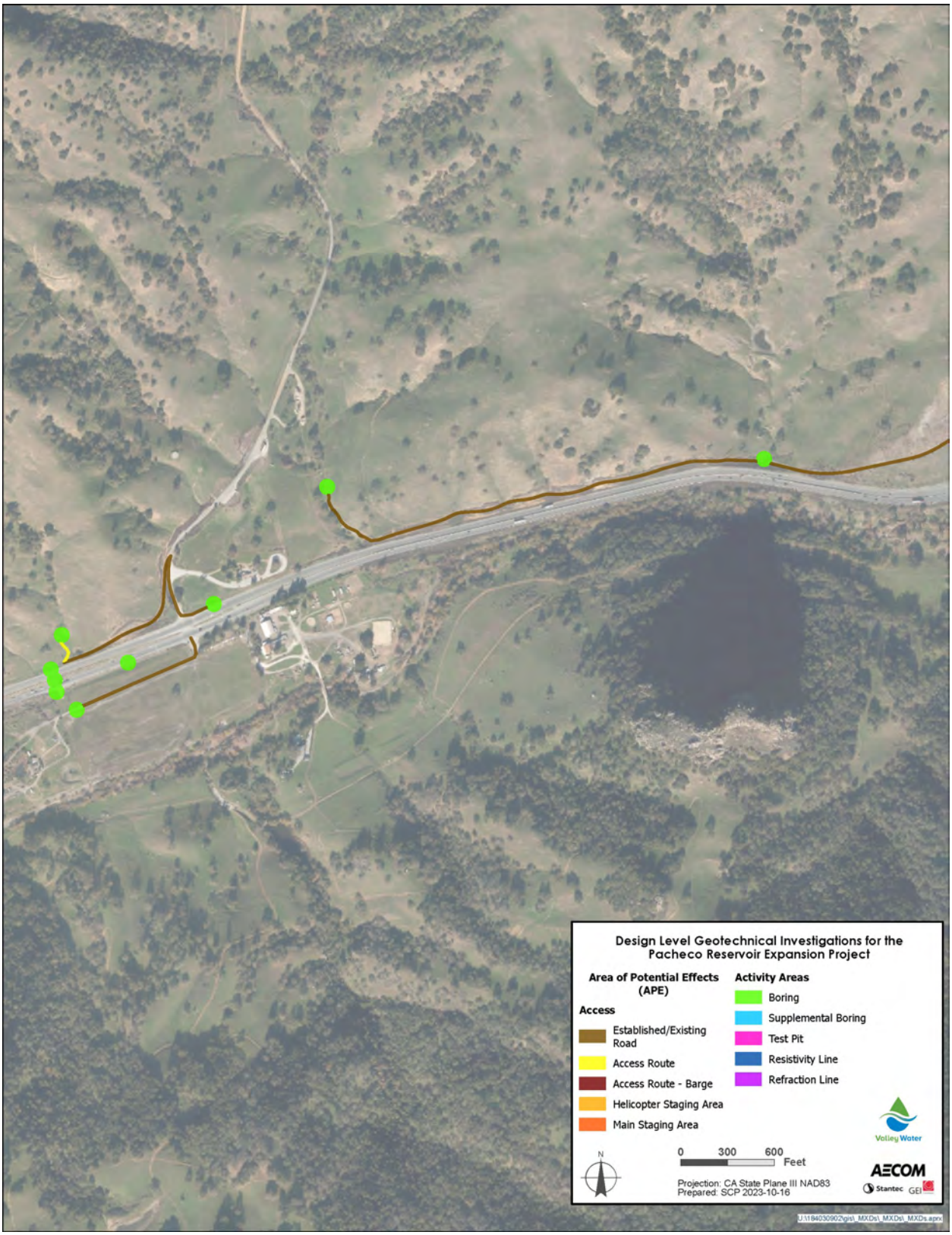

Area of Potential Effects – Page 4

Figure 2e

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

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October 25, 2023

Johnathan Costillas, Tribal Cultural Resource Officer
Tamien Nation
PO Box 866
Clearlake Oaks, CA 95423

Sent Via U.S. Mail &
E-Mail: jcostillas@tamien.org

Quirina Luna Geary, Chairwoman
Tamien Nation
PO Box 8053
San Jose, CA 95155

Sent Via U.S. Mail &
E-Mail: qgeary@tamien.org

Subject: Tribal Cultural Resources under the California Environmental Quality Act (CEQA), AB 52 (Gatto, 2014). Formal Notification of Decision to Propose Undertaking a Project, and Notification of Consultation Opportunity, pursuant to Public Resources Code §21080.3.1 (hereafter PRC).

Dear Mr. Costillas and Ms. Geary,

The Santa Clara Valley Water District (Valley Water) is proposing to undertake the Design Level Geotechnical Investigations (proposed project) in support of the Pacheco Reservoir Expansion Project (PREP). This letter is to formally notify you of a consultation opportunity pursuant to Public Resources Code (PRC) §21080.3.1.

Below please find a description of the Project location, a description of the proposed project, and the name of the project point of contact, pursuant to PRC §21080.3.1 (d).

The proposed project is located within, adjacent to, and in the vicinity of the existing Pacheco Reservoir, and along State Route 152 (SR-152) from Kaiser-Aetna Road to the site entrance located approximately one mile east of Kaiser-Aetna Road on the north side of SR-152. Pacheco Reservoir is located along North Fork Pacheco Creek and behind North Fork Dam (near 37.05022, -121.291754), roughly equidistant between the cities of Gilroy and Los Banos. The existing reservoir is located approximately one-half mile north of SR-152 in eastern Santa Clara County, California (Figure 1).

The proposed project would consist of basic geotechnical investigations and survey data collection for information gathering purposes in support of PREP design. Valley Water proposes to conduct geotechnical investigations to include geotechnical borings, test pits, electrical resistivity surveys, and seismic refraction surveys. The proposed project would include investigations at multiple locations in the general vicinity of and within Pacheco Reservoir, and along the SR-152 corridor from Kaiser-Aetna Road to the site access. The investigations would include:

- Drilling 120 soil and rock borings within the existing reservoir and in upland areas (see attached Figures 2a – 2e). This would include the installation and monitoring of 25 piezometers and four inclinometers. These borings are intended to support design of the PREP site access road, shell borrow area, core borrow area, conveyance line, tunnel foundation, shaft foundation, pipeline foundation, pumpstation foundation, SR-152 temporary site access improvements, reservoir rim landslide, spillway foundation, dam foundation, outlet, and channel restoration.
- Implementing surface geophysical surveys to include 16,970 feet of seismic refraction survey lines and 1,530 feet of electrical resistivity survey lines. Surface geophysical surveys would only result in

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minor soil disturbance from the temporary placement of 1/2-inch diameter stainless-steel electrodes and stakes.

- Excavating 32 excavator test pits to explore a potential borrow area for dam core zone material. Test pits would generally be about 10 to 20 feet long, 3 feet wide and up to 20 feet deep.
- Providing for equipment access via all-terrain track-mounted, truck mounted, trailer-mounted and barge based (if reservoir is inundated) drill rigs, and the placement and removal of rigs onto portable wooden work platforms via helicopter in steeper terrain.
- Drilling up to 30 supplemental soil and rock core borings that are assigned general locations. Supplemental borings are intended to fill in unforeseen data gaps that may still exist following completion of the initial design level geotechnical investigations, or where the results of design level investigations raise new questions or create new uncertainties.

Pursuant to PRC §21080.3.1 (b), the Tamien Nation has 30 days from the receipt of this notification to request consultation with Valley Water in writing. Should you have any questions, please contact me as Valley Water's point of contact for the proposed project:

Julianne O'Brien, Pacheco Project Delivery Unit Manager
Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, CA 95118
Direct Phone: (408) 630-2680
e-mail: JulianneOBrien@valleywater.org

Respectfully,

DocuSigned by:
Julianne M V O'Brien
7A1BCEDDC98143A...

10/25/2023

Julianne O'Brien
Pacheco Delivery Unit Manager

Attachments:
Figure 1: Design Level Geotechnical Investigations Project Location Map
Figures 2a–2e: Design Level Geotechnical Investigations Area of Potential Effects Map

Cc: Victor Gutierrez, Valley Water Senior Engineer
Ryan McCarter, Valley Water Deputy Operating Officer (Acting)
Todd Sexauer, Senior Environmental Planner

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Project Location Map
Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

Figure 1

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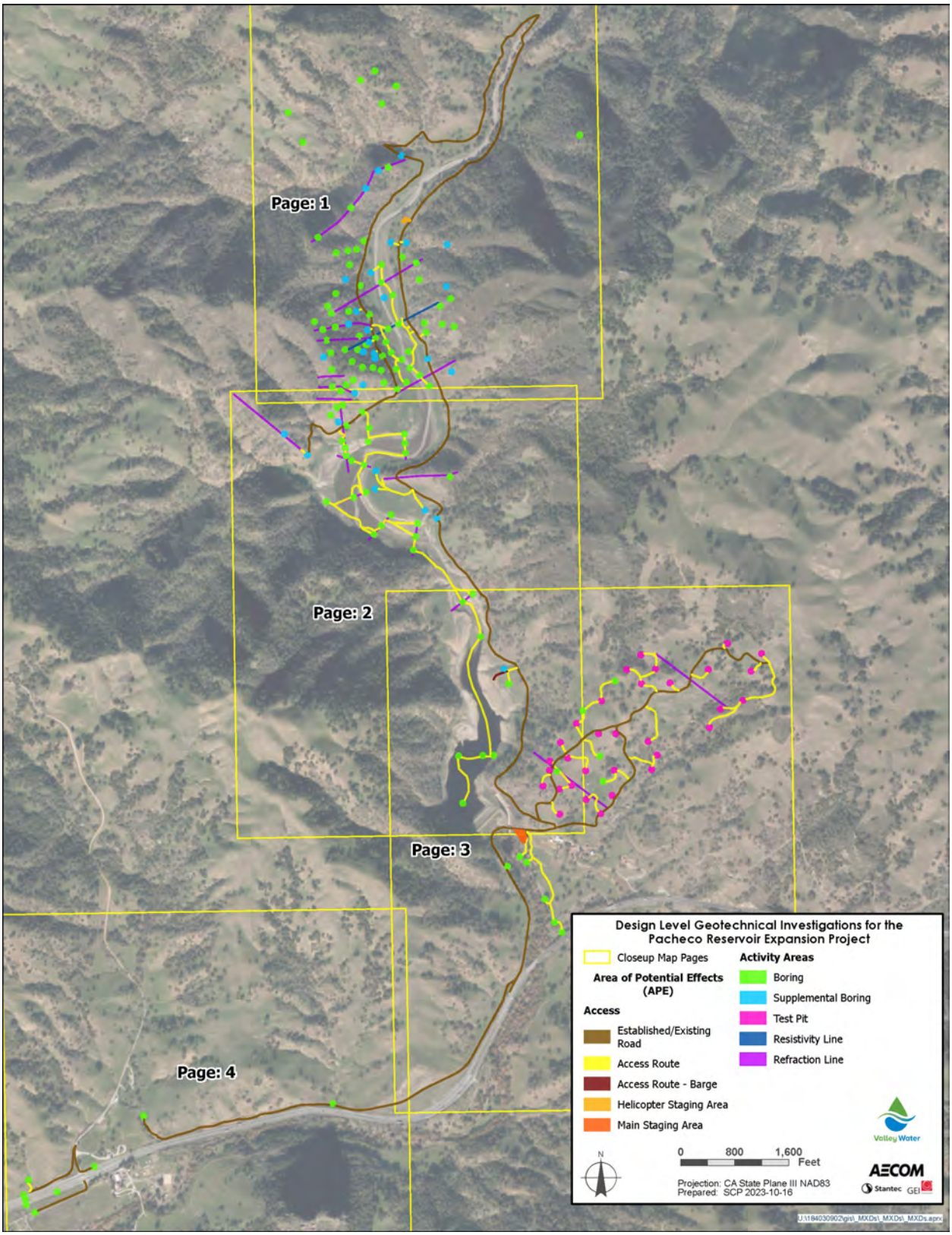

Area of Potential Effects - Index Map
Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

Figure 2a

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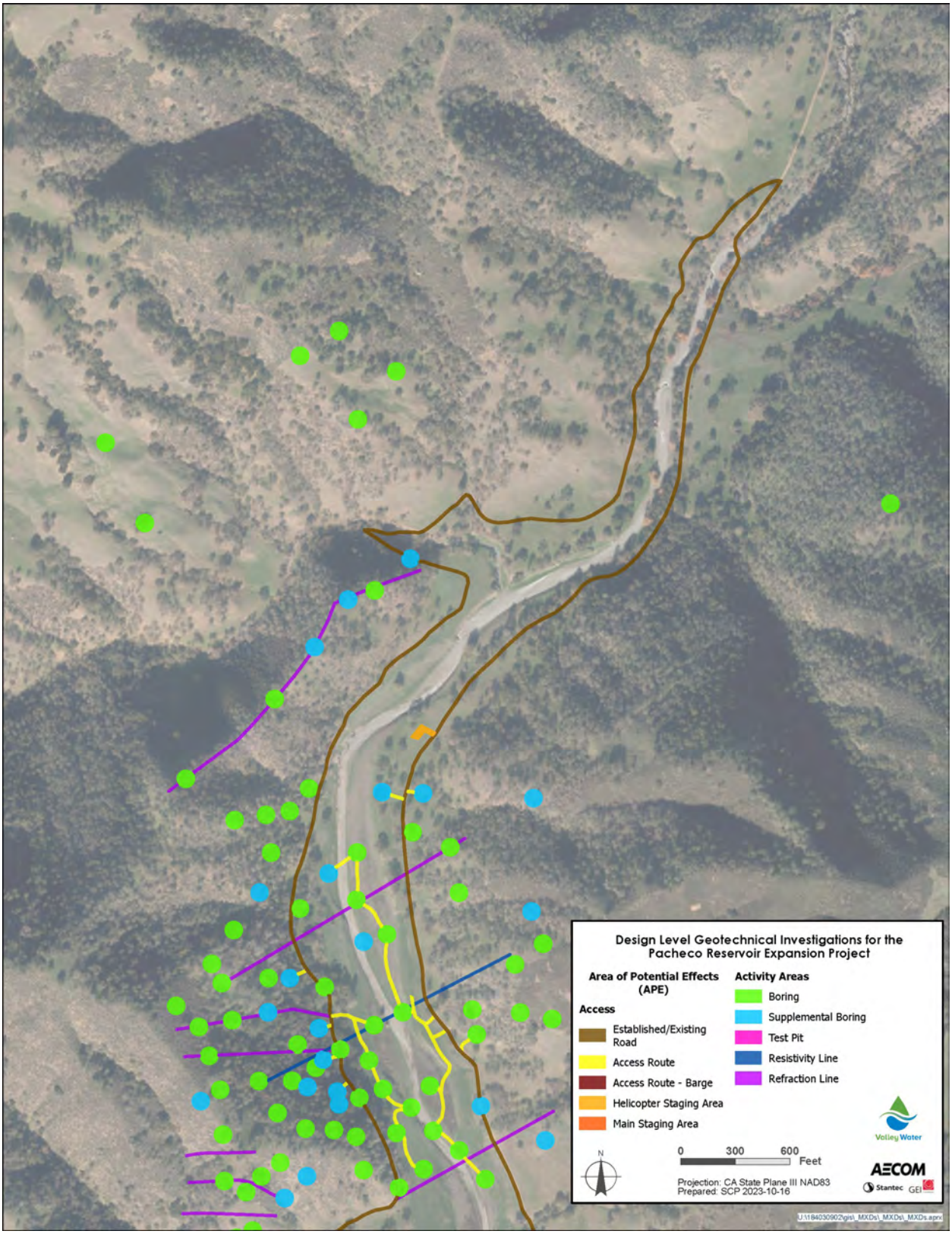

Figure 2b

Area of Potential Effects – Page 1

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

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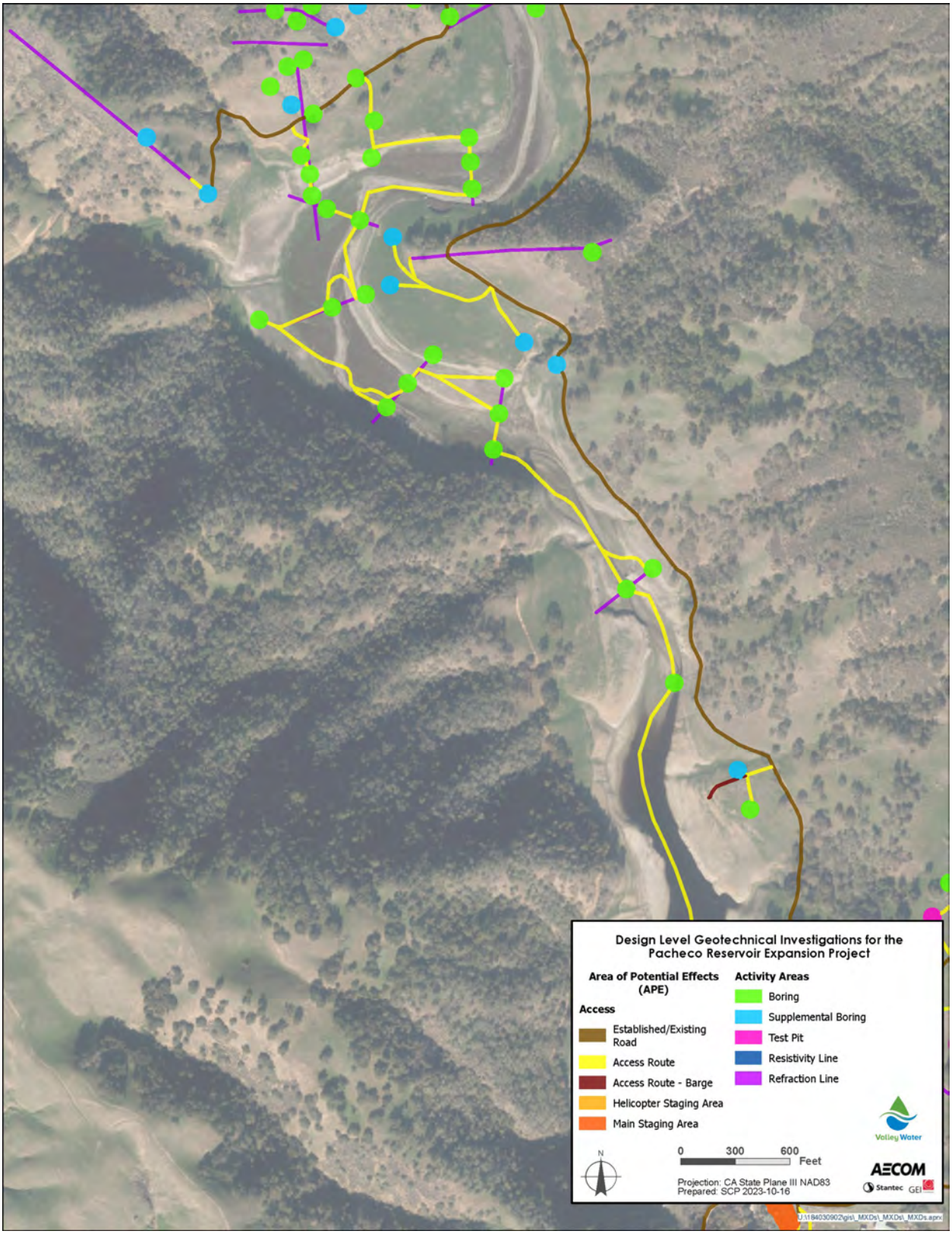

Area of Potential Effects – Page 2
Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

Figure 2c

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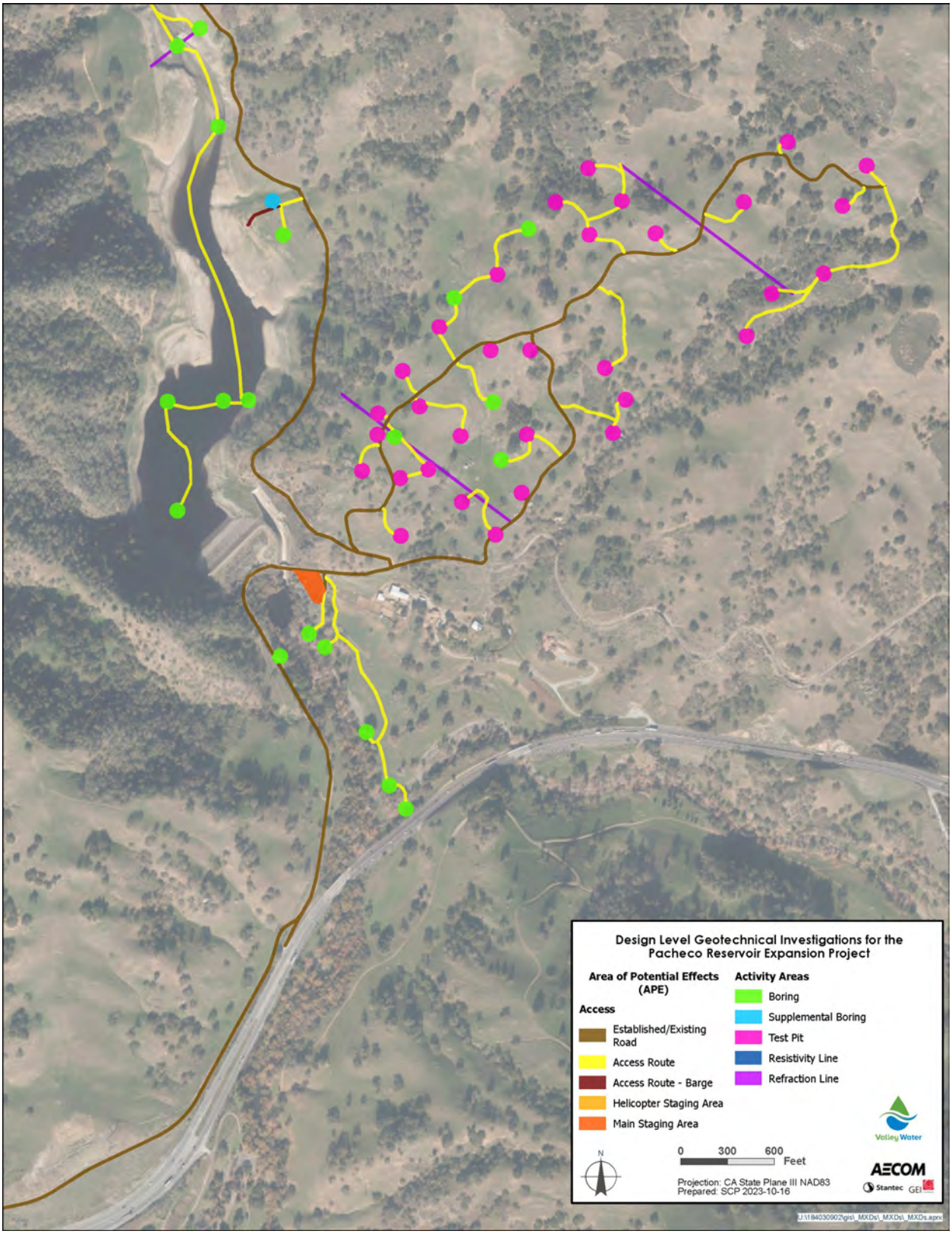

Area of Potential Effects – Page 3
Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project

Figure 2d

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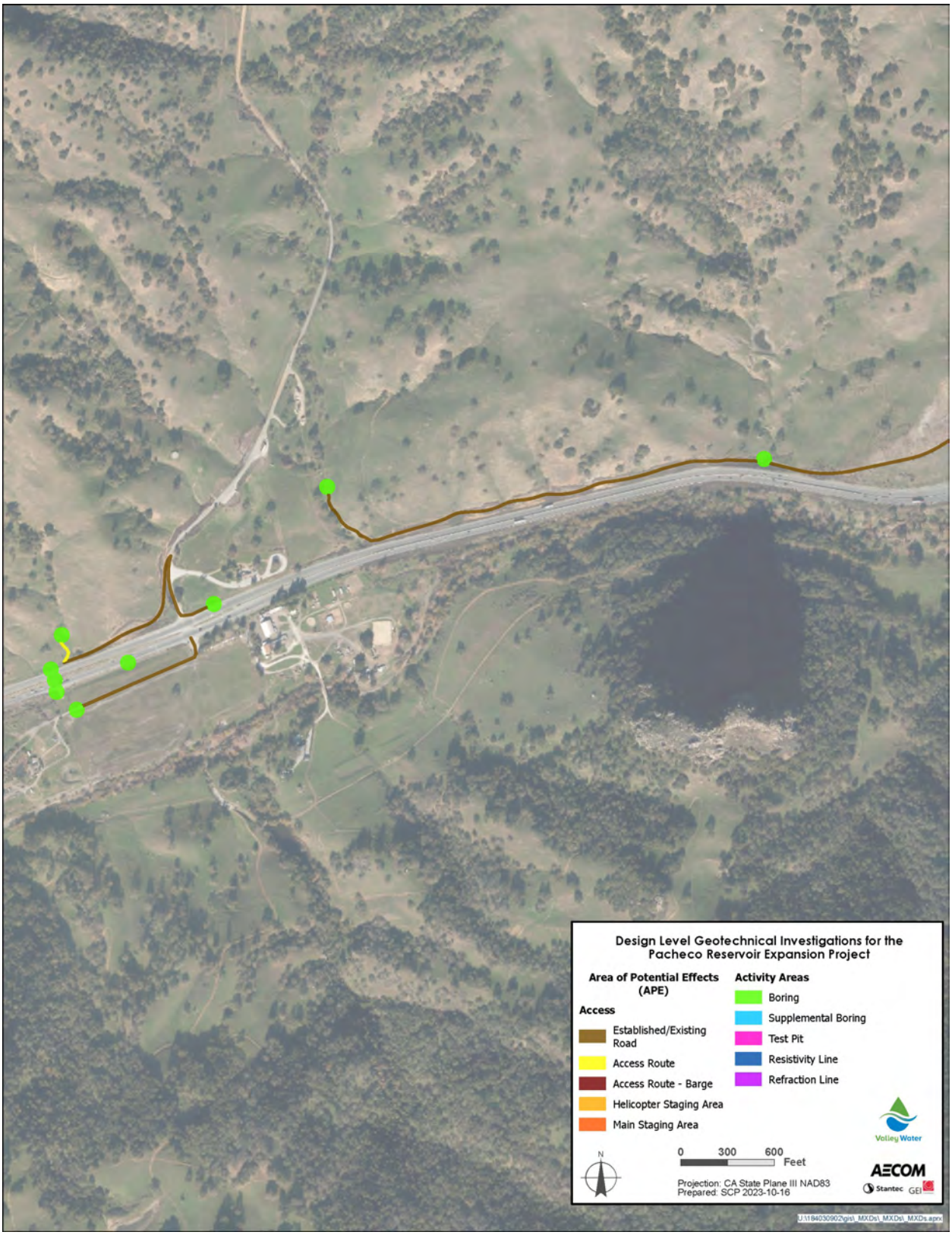

Area of Potential Effects – Page 4

Figure 2e

Design Level Geotechnical Investigations for the Pacheco Reservoir Expansion Project